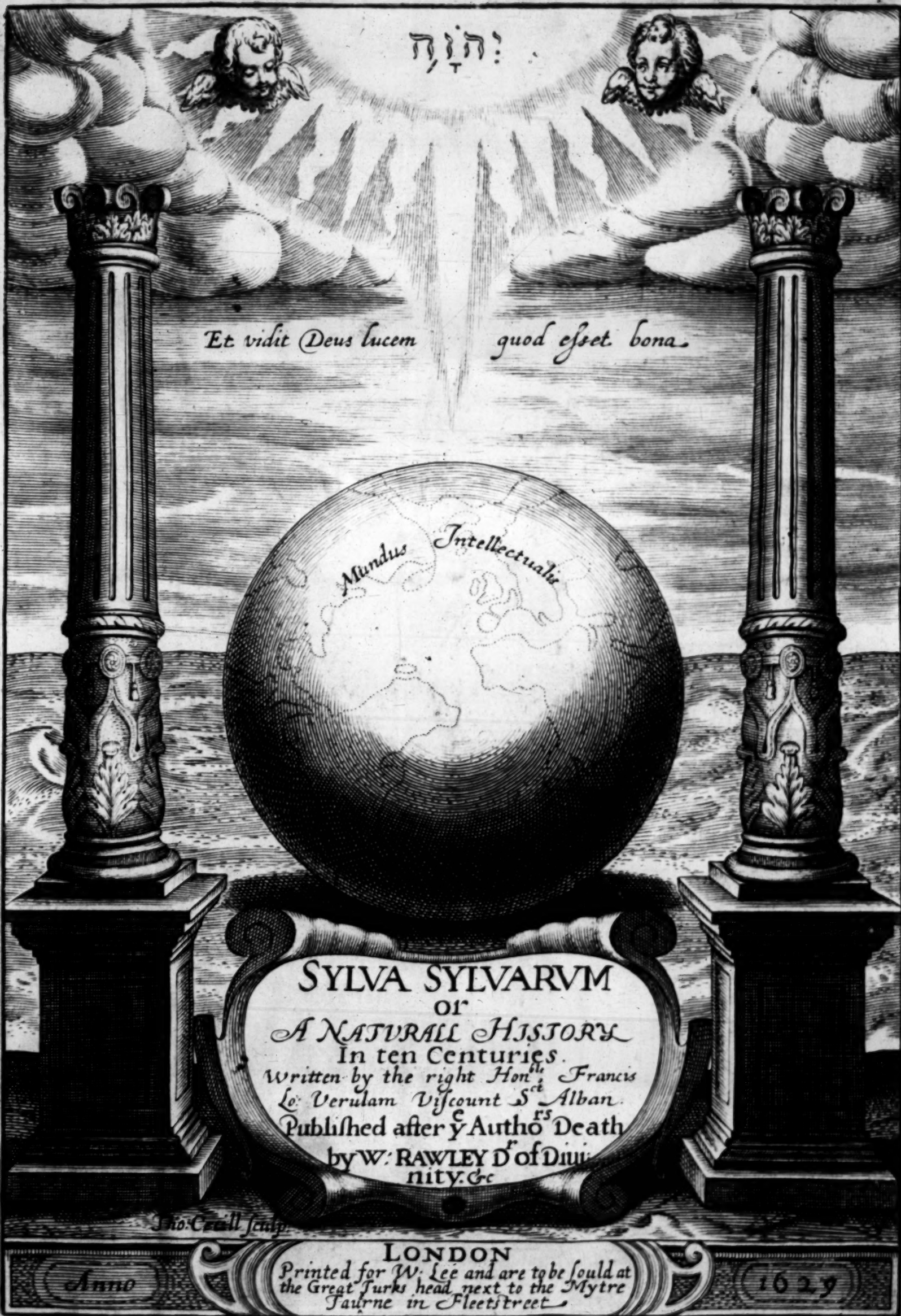




The right Hon<sup>ble</sup> Francis Lo: Veru-  
lam, Viscount S<sup>t</sup> Alban. mortuus 9 Aprilis,  
Anno Dñi. 1626. Annoq, Aetat 66.





וַיֵּרָא

Et vidit Deus lucem

quod esset bona.

Mundus Intellectualis

SYLVA SYLVARVM

OR

A NATURALL HISTORY

In ten Centuries.

Written by the right Hon<sup>ble</sup> Francis

Lo: Verulam Viscount S<sup>t</sup> Alban.

Published after y<sup>e</sup> Autho<sup>r</sup>s Death

by W: RAWLEY D<sup>r</sup> of Divi  
nity &c

Tho: Crall sculp.

LONDON

Printed for W. Lee and are to be sould at  
the Great Turke head next to the Mytre  
Tauerne in Fleetstreet

Anno

1629





Academia Cantabrigiensis  
Liber.



SYLVA <sup>XVII. 49. 6</sup>  
<sup>LE. 24. 26</sup>  
SYLVARVM:

OR  
A Naturall Historie.

IN TEN CENTURIES.

WRITTEN BY THE RIGHT  
*Honourable FRANCIS Lo. Verulam*  
Viscount St. ALBAN.

Published after the Authors death,  
By WILLIAM RAWLEY Doctor of Divinity,  
*late his Lordships Chaplaine.*

*The second Edition.*



LONDON,  
Printed by J. H. for William Lee at the Turkes  
Head in Fleet-street, next to the Miter. 1628.



SYLVAN  
SYLVAN

OR

A Natural History

OF THE

WILDERNESS BY THE RIGHT

HONORABLE JOHN WILSON

OF THE HOUSE OF COMMONS

IN PARLIAMENT ASSEMBLED

BY WILLIAM WILSON, Esq. Doctor of Divinity

and Chaplain to the Honorable House of Commons

The Second Edition



LONDON

Printed by J. H. for William Lee at the Turkey

Head in Fleet-Street, next to the Mint. 1758.





TO THE MOST HIGH  
AND MIGHTY PRINCE  
**CHARLES,**  
BY THE GRACE OF GOD,  
King of *Great Britaine, France, and*  
*Ireland, Defender of the Faith, &c.*

*May it please your most Excellent Maiesty;*



He whole Body of the *Natu-*  
*rall History*, either designed,  
or written, by the late *Lo.*  
*Viscount S. Alban*, was dedi-  
cated to your *Maiestie*, in his  
*Booke De Ventis*, about foure  
yeeres past, when your *Maiestie* was *Prince*:  
So as there needed no new Dedication of this  
*Worke*, but only, in all humblenessse, to let your  
*Maiestie* know, it is yours. It is true, if that *Lo.*  
had liued, your *Maiestie*, ere long, had beene  
inuoked, to the Protection of another *Historie*:  
Whereof, not *Natures Kingdome*, as in this,  
but



*The Epistle Dedicatory.*

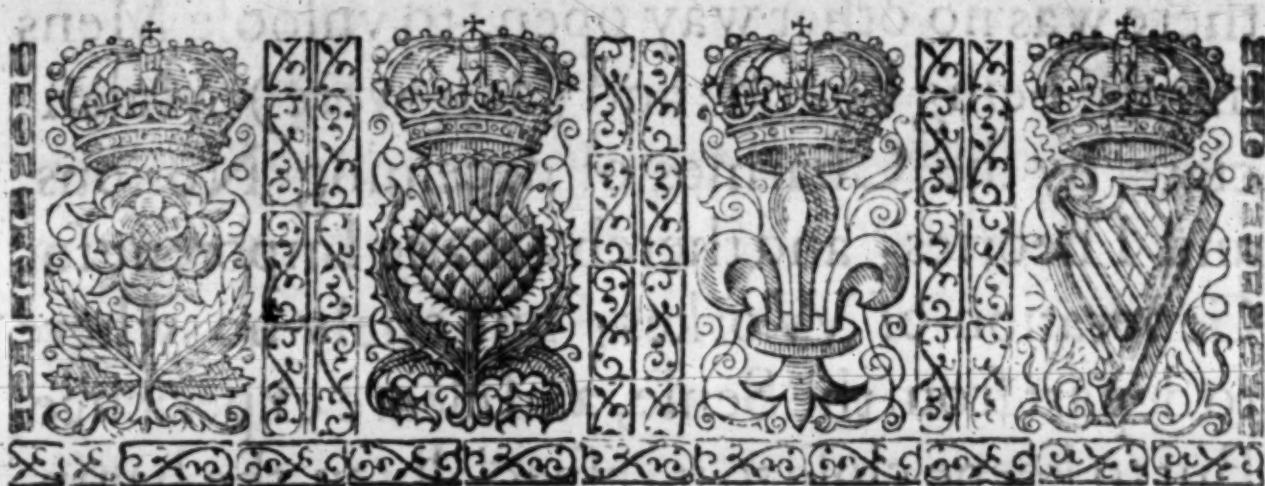
but these of your *Maiesties*, (during the Time and *Reigne* of *King Henry the Eighth*) had beene the Subiect: Which since it died vnder the Designation meerely, there is nothing left, but your *Maiesties* Princely Goodnesse, graciously to accept of the Vndertakers Heart, and Intentions, who was willing to haue parted, for a while, with his Darling *Philosophie*, that he might haue attended your Royall Commandement, in that other *Worke*. Thus much I haue beene bold, in all lowlinesse, to represent vnto your *Maiestie*, as one that was trusted with his *Lordships Writings*, euen to the last. And as this *Worke* affecteth the *Stampe* of your *Maiesties Royall Protection*, to make it more currant to the *World*; So vnder the *Protection* of this *Worke*, I presume in all humblenessse to approach your *Maiesties* presence; And to offer it vp into your *Sacred Hands*.

*Your MAIESTIES most Loyall*

*and Devoted Subiect,*

W. RAWLEY.





## To the Reader.



Having had the Honour to be continually with my Lord, in compiling of this *Worke*; And to be employed therein; I haue thought it not amisse, (with his Lordships good leaue and liking,) for the better satisfaction of those that shall reade it, to make knowne somewhat of his Lordships Intentions, touching the Ordering, and Publishing of the same. I haue heard his Lordship often say; that if should haue serued the glory of his owne Name, he had beene better not to haue published this *Naturall History*: For it may seeme an Indigested Heape of Particulars; And cannot haue that Lustre, which Bookes cast into Methods haue: But that he resolved to preferre the good of Men, and that which might best secure it, before any thing that might haue Relation to Himselfe. And he knew well, that

A

there



## TO THE READER.

there was no other way open, to vnloose Mens minds, being bound; and (as it were) Maleficate, by the Charmes of deceiuing Notions, and Theories; and thereby made Impotent for Generation of Workes; but onely no where to depart from the Sense, and cleare experience; But to keepe close to it, especially in the beginning: Besides, this *Naturall History* was a Debt of his, being Designed and set downe for a third part of the *Instauration*. I haue also heard his Lordship discourse, that Men (no Doubt) will thinke many of the *Experiments* contained in this Collection, to bee Vulgar and Triuiall; Meane and Sordid; Curious and Fruitlesse: And therefore he wisheth, that they would haue perpetually before their Eies, what is now in doing; And the Difference betweene this *Naturall History*, and others. For those *Naturall Histories*, which are Extant, being gathered for Delight and Vse, are full of pleasant Descriptions and Pictures; and affect and seek after Admiration, Rarities, and Secrets. But contrariwise, the Scope which his Lordship intendeth, is to write such a *Naturall History*, as may be Fundamental to the Erecting and Building of a true *Philosophy*: For the illumination of the *Vnderstanding*; the Extracting of *Axiomes*; and the producing of many Noble *Workes*, and *Effects*. For hee hopeth, by this meanes, to acquit Himselfe of that, for which he taketh  
*Himselfe*



## T O T H E R E A D E R.

*Himselfe* in a sort bound; And that is, the Advancement of all Learning & Sciences. For having in this present Worke Collected the Materials for the Building; And in his *Novum Organū* (of which his Lordship is yet to publish a Second Part,) set downe the Instruments and Directions for the VVorke; Men shall now be wanting to themselves, if they raise not Knowledge to that perfection, whereof the Nature of Mortall men is capable. And in this behalfe, I haue heard his Lordship speak complainingly; That his Lordship (who thinketh he deserueth to be an Architect in this building,) should be forced to bee a VVork-man and a Labourer; And to dig the Clay and burne the Brick; And more than that, (according to the hard Condition of the *Iffraelites* at the latter end) to gather the Straw and Stubble, ouer all the Fields, to burne the Bricks withall. For he knoweth, that except he doe it, nothing will be done: Men are so set to despise the Meanes of their owne good. And as for the *Basenesse* of many of the Experiments; As long as they be Gods VVorks, they are Honourable enough. And for the *Vulgarnesse* of them; true *Axiomes* must be drawne from plaine Experience, and not from doubtful; And his Lordships course is, to make Wonders Plaine, and not Plaine things Wonders; And that Experience likewise must bee broken and grinded, and not whole, or as it



## T O T H E R E A D E R .

groweth. And for *Vse*; his Lordship hath often in his Mouth, the two kinds of *Experiments*; *Experimenta Fructifera*, and *Experimenta Lucifera*: *Experiments of Vse*, and *Experiments of Light*; And he reporteth himselfe, whether he were not a strange Man, that should thinke that Light hath no *Vse*, because it hath no Matter. Further, his Lordship thought good also, to adde vnto many of the *Experiments* themselves, some *Glosse* of the *Causes*; that in the succeeding worke of *Interpreting Nature*, and *Framing Axiomes*, all things may bee in more Readinesse. And for the *Causes* herein by Him assigned; his Lordship perswadeth Himselfe, they are farre more certaine, than those that are rendred by Others; Not for any Excellency of his owne Wit (as his Lordship is wont to say) but in respect of his continuall Conuersation with *Nature* and *Experience*. Hee did consider likewise, that by this Addition of *Causes*, Mens minds (which make so much haste to finde out the *Causes* of things;) would not thinke themselves vtterly lost, in a Vast Wood of *Experience*, but stay vpon these *Causes* (such as they are) a little, till true *Axiomes* may bee more fully discovered. I haue heard his Lordship say also, that one great Reason, why hee would not put these particulars into any exact *Method* (though he that looketh attentiuely into them, shall finde that they haue a secret Order)



TO THE READER.

Order) was, because he conceived that other men would now thinke, that they could doe the like; And so goe on with a further Collection: which if the *Method* had beene Exact, many would haue despaired to attaine by Imitation. As for his Lordships loue of Order, I can refer any Man to his Lordships Latine Booke, *De Augmentis Scientiarum*; which (if my Iudgement be any thing) is written in the Exactest Order, that I know any Writing to be. I will conclude with an vsuall Speech of his Lordships; That this Worke of his *Naturall History*, is the *World*, as God made it, and not as Men haue made it; For that it hath nothing of Imagination.

W. Rawley.

A 3

This Epistle is the same, that should haue beene prefixed to this Booke, if his Lordship had liued.



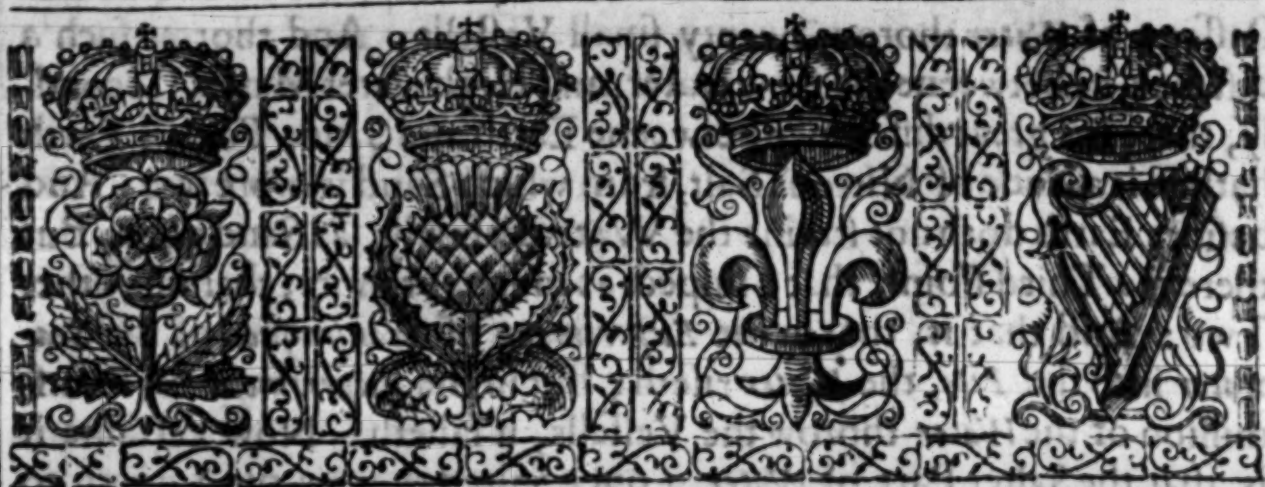
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like. And so go on with a further Collection:  
which if the Method had been Exact, many  
would have despised to attain by Imitation.  
As for his Lordships love of Order, I can re-  
fer any Man to his Lordships I am Book,  
De Argumentis Scientiarum; which (if my Judge-  
ment be any thing) is written in the Exactest  
Order, that I know any Writing to be. I will  
conclude with an small speech of his Lord-  
ships: That this Works of his, *Y natural His-*  
*ty*, is the World, as God made it, and not as Men  
have made it: For that it hath nothing of In-  
vention.

W. Randle.

A

This Epistle is  
the same, that  
should have  
been prefixed  
to the Book,  
if the Lordship  
had lived.





# NATVRALL HISTORIE.

## I. Century.



**D**igge a Pit vpon the *Sea shore*, somewhat about the High-water Marke, and sinke it as deepe as the Low-Water marke; And as the Tide commeth in, it will fill with *Water*, Fresh and Potable. This is commonly practised vpon the Coast of *Barbary*, where other fresh *Water* is wanting. And *CÆSAR* knew this well, when he was besieged in *Alexandria*: For by Digging of Pits in the *Sea shore*, hee did frustrate the Laborious Workes of the Enemies, which had turned the *Sea-Water* vpon the Wels of *Alexandria*; And so saued his Armie, being then in Desperation. But *Cæsar* mistooke the Cause; For he thought that all *Sea-Sands* had Naturall Springs of *Fresh Water*. But it is plaine, that it is the *Sea-Water*; because the Pit filleth according to the Measure of the *Tide*: And the *Sea-water* passing or Straining thorow the Sands, leaueth the Saltnesse.

I remember to haue Read, that Triall hath beene made of *Salt Water* passed thorow *Earth*; thorow Ten Vessells, one within another, and yet it hath not lost his Saltnesse, as to become potable: But the same Man saith, that (by the Relation of Another,) *Salt Water* drained thorow twentie Vessells, hath become Fresh. This *Experiment* seemeth to crosse that other of *Pits*, made by the *Sea-side*; And yet but in part, if it be true, that twentie Repetitions doe the Effect. But it is worth the Note, how poore the Imitations of Nature are, in Common course of *Experiments*, except they be led by great Iudgement, and some good Light of *Axiomes*. For first, there is no small difference betweene a  
Passage

I  
Experiments  
in *Consort*, tou-  
ching the  
Straining and  
Passing of Bo-  
dies, one tho-  
row another:  
which they call  
*Percolation*.



Passage of *Water* thorow twenty small Vessells; And thorow such a distance, as betweene the Low water, and High water Marke. Secondly, there is a great difference betweene Earth and Sand. For all Earth hath in it a kinde of Nitrous Salt, from which Sand is more free: And besides Earth doth not straine the *Water* so finely, as Sand doth. But there is a Third Point, that I suspect as much, or more, than the other Two: And that is, that in the *Experiment* of *Transmission* of the *Sea-water* into the *Pits*, the *Water* riseth; But in the *Experiment* of *Transmission* of the *Water* thorow the Vessells, it falleth: Now certaine it is, that the Salter Part of *Water*, (once Salted thorow-out) goeth to the Bottome. And therefore no maruell, if the Draining of *Water* by descent, doth not make it fresh: Besides, I doe somewhat doubt, that the very Dashing of the *Water*, that commeth from the Sea, is more proper to strike off the Salt part, than where the *Water* slideth of her owne Motion.

3

It seemeth *Percolation* or *Transmission*, (which is commonly called *Straining*,) is a good kinde of *Separation*; Not onely of Thicke from Thin, and Grosse from Fine; But of more subtile Natures; And varieth according to the Body thorow which the *Transmission* is made. As if thorow a woollen Bagge, the Liquor leaueth the Fatnesse; If thorow Sand, the Saltnesse; &c. They speake of Seuering Wine from Water, passing it thorow Ivy wood, or thorow other the like porous Body; But *Non Constat*.

4

The *Gumme* of *Trees* (which wee see to be commonly shining and cleare) is but a fine Passage or *Straining* of the Iuice of the Tree, thorow the Wood and Barke. And in like manner, *Cornish Diamonds*, and *Rocke Rubies*, (which are yet more resplendent than *Gummes*) are the fine Exudations of *Stone*.

5

*Aristotle* giueth the Cause, vainly, why the *Feathers* of *Birds* are of more liuely Colours, than the *Haires* of *Beasts*; for no *Beast* hath any fine Azure, or Carnation, or Greene *Haire*. He saith, It is, because *Birds* are more in the Beames of the Sunne, than *Beasts*; But that is manifestly vntrue; For *Cattle* are more in the Sunne than *Birds*, that liue commonly in the Woods, or in some Couert. The true Cause is, that the Excrementious Moisture of liuing Creatures, which maketh as well the *Feathers* in *Birds*, as the *Haire* in *Beasts*, passeth in *Birds* thorow a finer and more delicate Strainer, than it doth in *Beasts*: For *Feathers* passe thorow Quills; And *Haire* thorow Skin.

6

The *Clarifying* of *Liquors* by Adhesion is an Inward *Percolation*; And is effected, when some Cleauing Body is Mixed and Agitated with the *Liquors*; whereby the grosser Part of the *Liquor* stickes to that Cleauing Body; And so the finer Parts are freed from the Grosser. So the *Apothecaries* clarifie their *Sirrups* by whites of Egges, beaten with the Iuices which they would clarifie; which Whites of Egges, gather all the Dregges and grosser Parts of the Iuyce to them; And after the *Sirrup* being set on the Fire, the whites of Egges themselues harden, and are



are taken forth. So *Ippocrasse* is clarified by mixing with Milke; And stirring it about; And then passing it thorow a Woollen Bag, which they call *Hippocrates Sleene*: And the Cleaving Nature of the Milke draweth the Powder of the Spices, and Groffer parts of the *Liquor* to it; And in the passage they sticke vpon the Woollen Bag.

The *Clarifying of Water*, is an *Experiment* tending to Health; besides the pleasure of the Eye, when *Water* is Crystalline. It is effected by casting in and placing Pebbles, at the Head of a Current; that the *Water* may straine thorow them.

It may be, *Percolation* doth not onely cause Clearenesse and Splendor, but Sweetnesse of Sauour; For that also followeth, as well as Clearenesse, when the Finer Parts are seuered from the Groffer. So it is found; that the Sweats of men that haue much Heat, and exercise much, and haue cleane Bodies, and fine Skins, doe smell sweet; As was said of *Alexander*; And we see, commonly, that *Gummes* haue sweet Odours.

**T**AKE a *Glasse*, and put *Water* into it, and wet your Finger, and draw it round about the Lip of the *Glasse*, pressing it somewhat hard; And after you haue drawne it some few times about; it will make the *Water* friske and sprinkle vp, in a fine Dew. This *Instance* doth excellently Demonstrate the Force of *Compression* in a Solid Body. For whensoever a Solid Body (as Wood, Stone, Metall, &c.) is pressed, there is an inward Tumult in the parts thereof; seeking to deliuer themselves from the *Compression*: And this is the Cause of all *Violent Motion*. Wherein it is strange in the highest Degree, that this *Motion* hath neuer beene obserued, nor inquired; It being of all *Motions*, the most Common, and the Chiefe Root of all *Mechanicall Operations*. This *Motion* worketh in round at first, by way of Prooffe, and Search, which way to deliuer it selfe; And then worketh in progresse, where it findeth the Deliuernance easiest. In *Liquors* this *Motion* is visible: For all *Liquors* stricken make round Circles, and withall Dash; but in *Solids*, (which breake not) it is so subtile, as it is inuisible; But neuertheless bewrayeth it selfe by many Effects; As in this *Instance* whereof we speake. For the *Pressure* of the Finger furthered by the wetting (because it sticketh so much the better vnto the Lip of the *Glasse*) after some continuance, putteth all the small Parts of the *Glasse* into worke; that they strike the *Water* sharply; from which *Percussion* that Sprinkling commeth.

If you strike or pierce a *Solid Body*, that is brittle, as *Glasse*, or *Sugar*, it breaketh not only, where the immediate force is; but breaketh all about into shiuers and fitters; The *Motion*, vpon the *Pressure*, searching all waies; and breaking where it findeth the *Body* weakest.

The *Powder* in *Shot*, being Dilated into such a *Flame*, as endureth not *Compression*; Moueth likewise in round (The *Flame* being in the Nature of a *liquid Body*;) Sometimes recoiling; Sometimes breaking the *Pieco*;  
But

7

8

Experiments  
in Confort  
touching *Motion*  
of Bodies  
vpon their  
*Pressure*.

9

10

11



But generally discharging the *Bullet*, because there it findeth easiest Deliverance.

12

This *Motion* vpon *Pressure*, and the Reciprocall thereof, which is *Motion* vpon *Tensure*; we vse to call (by one common Name) *Motion of Liberty*; which is, when any *Body*, being forced to a *Preter-Naturall* Extent, or Dimension, deliuereth and restoreth it selfe to the *Naturall*: As when a *Blowne Bladder* (Pressed) riseth againe; or when *Leather* or *Cloth* tentured spring backe. These two *Motions* (of which there be infinite instances) we shall handle in due place.

13

This *Motion* vpon *Pressure* is excellently also demonstrated in *Sounds*; As when one Chimeth vpon a *Bell*, it soundeth; but as soone as he layeth his hand vpon it, the *Sound* ceaseth: And so, the *Sound* of a *Virginall String*, as soone as the *Quill* of a *Iacke* falleth vpon it, stoppeth. For these *Sounds* are produced, by the subtile Percussion of the Minute parts, of the *Bell*, or *String*, vpon the *Aire*; All one, as the *Water* is caused to leape by the subtile Percussion of the Minute parts of the *Glasse*, vpon the *Water*, whereof we spake a little before in the ninth *Experiment*. For you must not take it to be, the locall *Shaking* of the *Bell*, or *String*, that doth it. As we shall fully declare, when we come hereafter to handle *Sounds*.

Experiments  
in Consort tou-  
ching Separati-  
ons of Bodies by  
weight.

14

**T**Ake a *Glasse* with a *Belly* and a long *Neb*; fill the *Belly* (in part) with *Water*: Take also another *Glasse*, whereinto put *Claret Wine* and *Water* mingled; Reverse the first *Glasse*, with the *Belly* vpwards, Stopping the *Neb* with your finger; Then dip the Mouth of it within the Second *Glasse*, and remoue your Finger: Continue it in that posture for a time; And it will vnmingle the *Wine* from the *Water*: The *Wine* ascending and setting in the top of the vpper *Glasse*; And the *Water* descending and setting in the bottome of the lower *Glasse*. The passage is apparant to the Eye; For you shall see the *Wine*, as it were, in a small veine, rising thorow the *Water*. For handsomnesse sake (because the Working requireth some small time) it were good you hang the vpper *Glasse* vpon a Naile. But as soone as there is gathered so much pure and vnmixed *Water* in the bottome of the Lower *Glasse*, as that the Mouth of the vpper *Glasse* dippeth into it, the *Motion* ceaseth.

15

Let the Vpper *Glasse* be *Wine*, and the Lower *Water*; there followeth no *Motion* at all. Let the Vpper *Glasse* be *Water* pure, the Lower *Water* coloured; or contrariwise; there followeth no *Motion* at all. But it hath beene tried, that though the Mixture of *Wine* and *Water*, in the Lower *Glasse*, be three parts *Water*, and but one *Wine*; yet it doth not dead the *Motion*. This *Separation* of *Water* and *Wine* appeareth to be made by *Weight*; for it must be of *Bodies* of vnequall *Weight*, or else it worketh not; And the Heauier *Body* must euer be in the vpper *Glasse*. But then note withall, that the *Water* being made pensile, and there being a great *Weight* of *Water* in the *Belly* of the *Glasse*, sustained by



by a small Pillar of *Water* in the Necke of the *Glasse*; It is that, which setteth the *Motion* on worke: For *Water* and *Wine* in one *Glasse*, with long standing, will hardly seuer.

This *Experiment* would be Extended from Mixtures of seuerall *Liquors*, to *Simple Bodies*, which Consist of seuerall Similare Parts: Try it therefore with *Brine* or *Salt water*, and *Fresh water*; Placing the *Salt water* (which is the heauier) in the vpper *Glasse*; And see whether the *Fresh* will come aboue. Try it also with *Water thicke Sugred*, and *Pure water*; and see whether the *water* which commeth aboue, will lose his Sweetnesse: For which purpose it were good there were a little Cocke made in the Belly of the vpper *Glasse*.

**I**N *Bodies* containing Fine Spirits, which doe easily dissipate, when you make *Infusions*, the Rule is; A short Stay of the *Body* in the *Liquor* receiueth the Spirit; And a longer Stay confoundeth it; because it draweth forth the Earthy Part withall; which embaseth the finer. And therefore it is an Errour in *Physitians*, to rest simply vpon the Length of stay, for increasing the vertue. But if you will haue the *Infusion* strong, in those kinde of *Bodies*, which haue fine Spirits, your way is, not to giue Longer time, but to repeat the *Infusion* of the *Bodie* oftner. Take *Violets*, and infuse a good Pugill of them in a Quart of Vineger; Let them stay three quarters of an houre, and take them forth; And refresh the *Infusion* with like quantitie of new *Violets*, seuen times; And it will make a Vineger so fresh of the *Flower*, as if a Twelue-moneth after, it bee brought you in a Saucer, you shall smell it before it come at you. Note, that it smelleth more perfectly of the *Flower*, a good while after, than at first.

This Rule, which we haue giuen, is of singular vse, for the Preparations of *Medicines*, and other *Infusions*. As for Example; The Lease of *Burrage* hath an Excellent Spirit, to repress the fuliginous Vapour of Duskie Melancholy, and so to cure Madnesse: But neuertheless, if the Lease be infused long, it yeeldeth forth but a raw substance, of no Vertue; Therefore I suppose, that if in the Must of Wine, or Wort of Beere, while it worketh, before it bee Tunned, the *Burrage* stay a small time, and be often changed with fresh; It will make a Soueraigne Drinke for Melancholy Passions. And the like I conceiue of *Orange Flowers*.

*Rubarb* hath manifestly in it Parts of contrary Operations: Parts that purge; And parts that binde the Bodie: And the first lay looser, and the latter lay deeper: So that if you infuse *Rubarb* for an houre, and crush it well, it will purge better, and binde the Bodie lesse after the purging, than if it stood twentie foure houres; This is tried: But I conceiue likewise, that by Repeating the *Infusion* of *Rubarb*, seuerall times, (as was said of *Violets*,) letting each stay in but a small time; you may make it as strong a *Purging Medicine*, as *Scammony*. And it is not a small thing wonne in *Physicke*, if you can make *Rubarb*, and other *Medicines*

16

Experiments  
in Consort, tou-  
ching Iudicious  
and Accurate  
Infusions, both  
in Liquors, and  
Aire.

17

18

19



*cines* that are *Benedict*, as strong Purgers, as those that are not without some Malignity.

20

*Purging Medicines*, for the most part, haue their *Purgative* Vertue, in a fine Spirit; As appeareth by that they endure not boiling, without much losse of vertue. And therefore it is of good vse in *Physicke*, if you can retaine the *Purging* Vertue, and take away the Vnpleasant taste of the *Purger*; which it is like you may doe, by this course of *Infusing* oft, with little stay. For it is probable, that the Horrible and Odious Taste, is the Groffer part.

21

Generally, the working by *Infusions*, is grosse and blinde, except you first try the Issuing of the seuerall Parts of the Body, which of them Issue more speedily, and which more slowly; And so by apportioning the time, can take and leaue that Quality, which you desire. This to know, there be two waies; The one to try what long stay, and what short stay worketh, as hath beene said: The other to try in Order, the succeeding *Infusions*, of one and the same Body, successiue, in seuerall *Liquors*. As for example; Take *Orange-Pils*, or *Rose-Mary*, or *Cinnamon*, or what you will; And let them *Infuse* halfe an houre in *Water*: Then take them out, and *Infuse* them againe in other *Water*; And so the third time: And then taste and consider the *First Water*, the *Second*, and the *Third*: And you will find them differing, not only in Strength and Weaknesse, but otherwise in Taste, or Odour; For it may be the *First water* will haue more of the Scent, as more Fragrant; And the *Second* more of the Taste, as more Bitter or Biting, &c.

22

*Infusions* in *Aire*, (for so wee may well call *Odours*) haue the same diuersities with *Infusions* in *Water*; In that the seuerall *Odours* (which are in one Flower, or other Body) issue at seuerall times; Some earlier, some later: So we finde that *Violets*, *Woodbines*, *Strawberries*, yeeld a pleasing Scent, that commeth forth first; But soone after an ill Scent, quite differing from the Former; Which is caused, not so much by Mellowing, as by the late issuing of the Groffer Spirit.

23

As we may desire to extract the finest Spirits in some Cases; So we may desire also to discharge them (as hurtfull) in some other. So *Wine burnt*, by reason of the Euaporating of the finer Spirit, enflameth lesse, and is best in Agues: *Opium* leeseeth some of his poisonous Quality, if it be vapoured out, mingled with *Spirit of Wine*, or the like: *Sean* leeseeth somewhat of his windinesse by Decocting; And (generally) subtil or windy Spirits are taken off by incension, or Evaporation. And euen in *Infusions* in things that are of too high a Spirit, you were better powre off the first *Infusion*, after a small time, and vse the latter.

Experiment  
Solitary touching the  
Appetite of Continuations in  
Liquids.

24

**B**ubbles are in the forme of an *Hemisphere*; *Aire* within, and a little Skin of *Water* without: And it seemeth somewhat strange, that the *Aire* should rise so swiftly, while it is in the *Water*; And when it commeth to the top, should be staid by so weake a Couer as that of the *Bubble* is. But as for the swift Ascent of the *Aire*, while it is vnder the

the



the *Water*, that is a *Motion* of *Percussion* from the *Water*; which it selfe descending, driueth vp the *Aire*; and no *Motion* of *Leuity* in the *Aire*. And this *Democritus* called *Motus Plaga*. In this Common *Experiment*, the Cause of the Enclosure of the *Bubble* is, for that the Appetite to resist Separation, or Discontinuance (which in solid *Bodies* is strong) is also in *Liquours*, though fainter and weaker; As we see in this of the *Bubble*: we see it also in little Glasses of Spittle that children make of Rushes; And in Castles of Bubbles, which they make by blowing into *Water*, hauing obtained a little Degree of Tenacity by Mixture of Soape: We see it also in the *Stillicides* of *water*, which if there be *water* enough to follow, will Draw themselves into a small thred, because they will not discontinue; But if there be no Remedy, then they cast themselves into round Drops; which is the Figure, that saueth the Body most from Discontinuance: The same Reason is of the Roundnesse of the *Bubble*, as well for the Skin of *water*, as for the *Aire* within: For the *Aire* likewise auoideth *Discontinuance*; And therefore casteth it selfe into a Round Figure. And for the stop and Arrest of the *Aire* a little while, it sheweth that the *Aire* of it selfe hath little, or no Apperite, or Ascending.

THE Reiection, which I continually vse, of *Experiments*, (though it appeareth not) is infinit; But yet if an *Experiment* be probable in the Worke, and of great Vse, I receiue it, but deliuer it as doubtfull. It was reported by a Sober Man, that an *Artificiall Spring* may be made thus: Finde out a hanging Ground, where there is a good quicke Fall of Rain-water. Lay a Half Trough of Stone, of a good length, three or foure foot deep within the same Ground; with one end vpon the high Ground, the other vpon the low. Couer the Trough with Brakes a good thicknesse, and cast Sand vpon the Top of the Brakes: You shall see (saith hee) that after some showers are past, the lower End of the Trough will runne like a *Spring* of *Water*: which is no maruell, if it hold, while the Rain-water lasteth; But he said it would continue long time after the Raine is past: As if the water did multiply it selfe vpon the *Aire*, by the helpe of the Coldnesse and Condensation of the Earth, and the Consort of the first *Water*.

THE *French* (which put off the Name of the *French Disease*; vnto the Name of the *Disease* of *Naples*) doe report, that at the Siege of *Naples*, there were certaine wicked Merchants, that Barrelled vp *Mans flesh* (of some that had beene, lately slaine in *Barbery*) and sold it for *Tunny*; And that vpon that foule and high Nourishment, was the Originall of that *Disease*. Which may well be; For that it is certaine, that the *Canibals* in the *West Indies*, eat *Mans flesh*; And the *West Indies* were full of the Pocks when they were first discovered: And at this day the *Mortallest poisons*, practised by the *West-Indians*, haue some Mixture of the Bloud, or Fat, or *Flesh* of *Man*: And diuers Witches, and

B

Sorce-

Experiment  
Solitary tou-  
ching the Ma-  
king of Artifi-  
ciall Springs.

25

Experiment  
Solitary tou-  
ching the Ve-  
nerous Quality  
of Mans Flesh.

26



Sorceresses, as well amongst the *Heathen*, as amongst the *Christians*, haue fed vpon *Mans flesh*, to aid (as it seemeth) their Imagination, with High and foule Vapours.

Experiment  
Solitary tou-  
ching the Ver-  
sion and Trans-  
mutation of  
*Aire* into *Water*.

27

**I**T seemeth that there be these waies (in likelihood) of *Version* of *Vapours*, or *Aire*, into *Water* and *Moisture*. The first is *Cold*; which doth manifestly Condense; As wee see in the *Contracting* of the *Aire* in the *Weather-Glasse*; whereby it is a Degree neerer to *Water*. We see it also in the *Generation* of *Springs*, which the *Ancients* thought (very probably) to be made by the *Version* of *Aire* into *Water*, holpen by the *Rest*, which the *Aire* hath in those Parts; whereby it cannot dissipate. And by the *Coldnesse* of *Rocks*; for there *Springs* are chiefly generated. Wee see it also in the Effects of the *Cold* of the *Middle Region* (as they call it) of the *Aire*; which produceth *Dews*, and *Raines*. And the Experiment of turning *Water* into *Ice*, by *Snow*, *Nitre*, and *Salt* (whereof wee shall speake hereafter) would be transferred to the Turning of *Aire* into *Water*. The Second way is by *Compression*; As in *Stillatories*, where the Vapour is turned backe, vpon it selfe, by the Encounter of the Sides of the *Stillatory*; And in the *Dew* vpon the Couers of *Boyling Pots*; And in the *Dew* towards *Raine*, vpon *Marble*, and *Wainscot*. But this is like to doe no great effect; Except it be vpon Vapours, and grosse *Aire*, that are already very neere in Degree to *Water*. The Third is that, which may be searched into, but doth not yet appeare; which is, by *Mingling* of moist Vapours with *Aire*; And trying if they will not bring a Returne of more *Water*, then the *water* was at first: For if so; That Increase is a *version* of the *Aire*: Therefore put water into the Bottome of a *Stillatory*, with the *Neb* stopped; Weigh the *Water* first; Hang in the Middle of the *Stillatory* a large *Sponge*; And see what Quantity of *Water* you can crush out of it; And what it is more, or lesse, compared with the *water* spent; For you must vnderstand, that if any *version* can be wrought, it will be easiest done in small Pores: And that is the Reason why we prescribe a *Sponge*. The Fourth way is Probable also, though not Appearing; Which is, by *Receiuing* the *Aire* into the small Pores of *Bodies*; For (as hath beene said) euery thing in small Quantity is more easie for *version*; And Tangible Bodies haue no pleasure in the Consort of *Aire*, but endeaour to subact it into a more *Dense Body*: But in *Entire Bodies* it is checked; because if the *Aire* should Condense, there is nothing to succeed: Therefore it must be in loose *Bodies*, as *Sand* and *Powder*; which we see, if they lie close, of themselves gather Moisture.

Experiment  
Solitary tou-  
ching *Helpes*  
towards the  
*Beauty* and  
good Features  
of Persons.

28

**I**T is reported by some of the *Ancients*; That *Whelps*, or other *Creatures*, if they be put Young, into such a *Cage*, or *Box*, as they cannot rise to their Stature, but may encrease in Breadth, or length; will grow accordingly, as they can get Roome: which if it bee true, and saifible, and that the young *Creature* so pressed, and straightened,



tened, doth not thereupon die; It is a Meanes to produce *Dwarfe Creatures*, and in a very Strange Figure. This is certaine, and noted long since; That the Pressure or Forming of Parts of Creatures, when they are very young, doth alter the Shape not a little; As the Stroaking of the Heads of Infants, betweene the Hands, was noted of Old, to make *Macrocephali*; which shape of the Head, at that time, was esteemed. And the Raising gently of the Bridge of the Nose, doth prevent the Deformity of a Saddle Nose. Which obseruation well weighed, may reach a Meanes, to make the Persons of Men, and Women, in many kinds, more comely, and better featured, than otherwise they would be; By the Forming and Shaping of them in their Infancy: As by Stroaking vp the Calues of the Legs, to keepe them from falling downe too low; And by Stroaking vp the Forehead to keepe them from being low-foreheaded. And it is a common Practise to swathe Infants, that they may grow more straight, and better shaped: And we see Young Women, by wearing straight Bodies, keepe themselves from being Grosse, and Corpulent.

**O** *Nions*, as they hang, will many of them shoot forth; And so will *Penni roiall*; And so will an Herbe called *Orpin*; with which they vse, in the Country, to trim their Houses, binding it to a Lath, or Sticke, and setting it against a wall. We see it likewise, more especiall'y, in the greater *Semper-vine*, which will put out Branches, two or three yeeres: But it is true, that commonly they wrap the Root in a Cloth besmeared with *Oile*, and renew it once in halfe a Yeere. The like is reported by some of the *Ancients*, of the *Stalks of Lillies*. The Cause is; For that these *Plants* haue a Strong, Dense, and Succulent Moisture, which is not apt to exhale; And so is able, from the old store, without drawing helpe from the Earth, to suffice the sprouting of the *Plant*: And this Sprouting is chiefly in the late Spring, or early Sommer; which are the Times of Putting forth. We see also, that *Stumps of Trees*, lying out of the ground, will put forth Sprouts for a Time. But it is a Noble Triall, and of very great Consequence, to try whether these things, in the Sprouting, doe increase *Weight*; which must be tried by weighing them before they bee hanged vp; And afterwards againe, when they are sprouted. For if they encrease not in *Weight*; Then it is no more but this; That what they send forth in the Sprout, they leese in some other Part: But if they gather *Weight*, then it is *Magnale Nature*; For it sheweth that *Aire* may be made so to be Condensed, as to be conuerted into a *Dense Body*; whereas the Race and Period of all things, here aboue the Earth, is to extenuate and turne things to bee more *Pneumaticall*, and Rare; And not to be Retrograde, from *Pneumaticall* to that which is *Dense*. It sheweth also, that *Aire* can *Nourish*; which is another great Matter of Consequence. Note, that to try this, the *Experiment* of the *Semper-vine* must bee made without Oiling the Cloth; For else, it may be, the *Plant* receiueth Nourishment from the *Oile*.

Experiment  
Solitary touching the  
condensing of *Aire*,  
in such sort as  
it may put on  
weight, and  
yeeld Nourishment.

29



Experiment  
Solitary tou-  
ching the Com-  
mixture of  
Flame and Aire,  
and the great  
Force thereof.

30

**F**lame and Aire doe not Mingle, except it be in an *Instant*; Or in the *Vitall Spirits* of *vegetables*, and *living Creatures*. In *Gunpowder*, the Force of it hath beene ascribed, to Rarefaction of the Earthy Substance into *Flame*; And thus farre it is true: And then (forsooth) it is become another Element; the Forme whereof occupieth more place; And so, of Necessity, followeth a Dilatation: And therefore, lest two Bodies should be in one place, there must needs also follow an Expulsion of the pellet; Or Blowing vp of the Mme. But these are Crude and Ignorant Speculations. For *Flame*, if there were nothing else, except it were in very great quantity, will be suffocate with any hard Body, such as a Pellet is, Or the Barrell of a Gunne; So as the *Flame* would not expell the hard Body; But the hard Body would kill the *Flame*, and not suffer it to kindle, or spread. But the cause of this so potent a Motion, is the *Nitre*, (which we call otherwise *Salt-Petre*;) which hauing in it a notable Crude and windy *Spirit*, first by the *Heat* of the *Fire* suddenly dilateth it selfe; (And we know that simple *Aire*, being preternaturally attenuated by *Heat*, will make it selfe Roome, and breake and blow vp that which resisteth it;) And Secondly, when the *Nitre* hath dilated it selfe, it bloweth abroad the *Flame*, as an inward Bellows. And therefore we see that *Brimstone*, *Pitch*, *Camphire*, *Wilde-Fire*, and diuers other Inflammable Matters, though they burne cruelly, and are hard to quench; Yet they make no such fiery winde, as *Gunpowder* doth: And on the other side, we see that *Quick-silver*, (which is a most Crude and Watry Body) heated, and pent in, hath the like force with *Gunpowder*. As for *living Creatures*, it is certaine, their *Vitall Spirits* are a Substance Compounded of an *Airy* and *Flamy* Matter; And though *Aire* and *Flame* being free, will not well mingle; yet bound in by a *Body* that hath some fixing, they will. For that you may best see in those two Bodies (which are their *Aliments*;) *Water*, and *Oile*; For they likewise will not well mingle of themselves, but in the Bodies of *Plants*, and *living Creatures*, they will. It is no maruell therefore, that a small *Quantity* of *Spirits*, in the Cells of the Braine, and Canales of the Sinewes, are able to moue the whole Body, (which is of so great Masse) both with so great Force, as in Wrestling, Leaping; And with so great Swiftnesse, As in playing Diuision vpon the *Lute*. Such is the force of these two Natures, *Aire* and *Flame*, when they incorporate.

Experiment  
Solitary tou-  
ching the Se-  
cret Nature of  
Flame.

31

**T**Ake a small *Wax Candle*, and put it in a Socker, of *Brasse*, or *Iron*; Then set it vpright in a Porringer full of *Spirit of Wine*, heated: Then set both the *Candle*, and *Spirit of Wine*, on fire, and you shall see the *Flame* of the *Candle*, open it selfe, and become 4. or 5. times bigger than otherwise it would haue beene; and appeare in Figure *Globular*, and not in *Piramis*. You shall see also, that the Inward *Flame* of the *Candle* keepeth Colour, and doth not wax any whit blue towards the Colour of the Outward flame of the *Spirit of Wine*. This is a Noble Instance;



*Instance*; wherein two things are most remarkable; The one; that one *Flame* within another quencheth not; but is a fixed Body, and contiueth as *Aire*, or *Water* doe. And therefore *Flame* would still ascend upwards in one greatnesse, if it were not quenched on the *Sides*: And the greater the *Flame* is at the Bottome, the higher is the Rise. The other, that *Flame* doth not mingle with *Flame*, as *Aire* doth with *Aire*, or *Water* with *Water*, but only remaineth contiguous; As it commeth to passe betwixt Consisting Bodies. It appeareth also, that the forme of a *Piramis* in *Flame*, which we vsually see, is meerely by Accident, and that the *Aire* about, by quenching the *Sides* of the *Flame*, crusheth it, and extenuateth it into that Forme; For of it selfe it would be Round: And therefore *Smoake* is in the Figure of a *Piramis Reuerfed*; For the *Aire* quencheth the *Flame*, and receiue the *Smoake*. Note also, that the *Flame* of the *Candle*, within the *Flame* of the *Spirit of Wine*, is troubled; And doth not onely open and moue vpwards, but moueth wauing, and to and fro: As if *Flame* of his owne Nature (if it were not quenched) would rowle and turne, as well as moue vpwards. By all which, it should seeme, that the Cælestiall Bodies, (most of them) are true *Fires* or *Flames*, as the *Stoicks* held; More fine (perhaps) and Rarified, than our *Flame* is. For they are all Globular, and determinate; They haue Rotation; And they haue the Colour and Splendour of *Flame*: So that *Flame* aboue is Durable, and Consistent, and in his Naturall place; But with vs, it is a Stranger, and Momentany, and Impure; Like *Vulcan* that halted with his Fall.

**T**AKE an *Arrow*, and hold it in *Flame*, for the space of ten pulses; And when it commeth forth, you shall finde those Parts of the *Arrow*, which were on the Outfides of the *Flame*, more burned, blacked, and turned almost into a Coale; whereas that in the Middest of the *Flame*, will be, as if the Fire had scarce touched it. This is an *Instance* of great consequence for the discovery of the Nature of *Flame*; And sheweth manifestly, that *Flame* burneth more violently towards the *Sides*, than in the Middest: And, which is more, that *Heat* or *Fire* is not violent or furious, but where it is checked and pent. And therefore the *Peripatetickes* (howsoeuer their opinion of an *Element* of *Fire* about the *Aire* is iustly exploded;) in that Point they acquit themselves well: For being opposed, that if there were a *Spheare* of *Fire*, that incompassed the Earth so neere hand, it were impossible but all things should be burnt vp; They answer, that the pure *Elementall Fire*, in his owne place, and not irritate, is but of a Moderate *Heat*.

**I**T is affirmed constantly by many, as an vsuall Experiment; That a *Lumpe* of *Fre*, in the Bottome of a Mine, will be rumbled, and stirred, by two Mens strength; which if you bring it to the Top of the Earth, will aske Six Mens strength at the least to stirre it. It is a Noble *Instance*, and is fit to be tried to the full: For it is very probable, that the Motion

Experiment Solitary touching the Different force of *Flame* in the Middest and on the *Sides*.

32

Experiment Solitary touching the Decrease of the Naturall motion of Gravity in great distance from the Earth, or within some depth of the Earth.

33



of Gravity worketh weakly, both farre from the Earth, and also within the Earth: The former, because the Appetite of Vnion of Dense Bodies with the Earth, in respect of the distance, is more dull; The latter, because the Body hath in part attained his Nature, when it is some Depth in the Earth. For as for the Morning to a *Point* or place (which was the Opinion of the *Ancients*) it is a meere Vanity.

Experiment  
Solitary tou-  
ching the Con-  
traction of Bo-  
dies in Bulke, by  
the Mixture of  
the more Li-  
quid Body with  
the more Solid.

34

**I**T is strange, how the *Ancients* tooke vp *Experiments* vpon credit, and yet did build great Matters vpon them. The Obseruation of some of the best of them, deliuered confidently is, That a *Vessell* filled with *Ashes*, will receiue the like quantity of *Water*, that it would haue done, if it had beene empty. But this is vtterly vntrue; for the *Water* will not goe in by a Fifth part. And I suppose, that that Fifth part is the difference of the lying close, or open, of the *Ashes*; As we see that *Ashes* alone, if they be hard pressed, will lie in lesse roome: And so the *Ashes* with Aire betweene, lie looser; and with *Water*, closer. For I haue not yet found certainly, that the *Water*, it selfe, by mixture of *Ashes*, or *Dust*, will shrink or draw into lesse Roome.

Experiment  
Solitary tou-  
ching the Ma-  
king Vines more  
fruitfull.

35

**I**T is reported of credit, that if you lay good store of *Kernels* of *Grapes*, about the *Root* of a *Vine*; it will make the *Vine* come earlier, and prosper better. It may be tried with other *Kernels*, laid about the *Root* of a *Plant* of the same kinde; As *Figs*, *Kernels* of *Apples*, &c. The Cause may be, for that the *Kernels* draw out of the Earth Iuice fit to nourish the *Tree*, as those that would be *Trees* of themselues, though there were no *Root*; But the *Root* being of greater strength, robberh and deuoureth the Nourishment, when they haue drawne it: As great *Fishes* deuoure little.

Experiments  
in Consort  
touching Pur-  
ging Medicines.

36

**T**He Operation of *Purging Medicines*, and the *Causes* thereof, haue bin thought to be a great Secret; And so according to the slothful manner of Men, it is referred to a *Hidden Propriety*, a *Specificall vertue*, and a *Fourth Qualitie*, and the like Shifts of Ignorance. The *Causes* of *Purging* are diuers; All plaine and perspicuous; And thoroughly maintained by Experience. The first is, That whatsoever cannot be overcome and digested by the *Stomacke*, is by the *Stomacke*, either put vp by *Vomit*, or put downe to the *Guts*; And by that *Motion* of *Expulsion* in the *Stomacke*, and *Guts*, other *Parts* of the *Body* (as the *Orifices* of the *Veines*, and the like) are moued to expell by *Consent*. For nothing is more frequent than *Motion* of *Consent* in the *Body* of Man. This Surcharge of the *Stomacke*, is caused either by the *Qualitie* of the *Medicine*, or by the *Quantitie*. The *Qualities* are three: *Extreme Bitter*, as in *Aloës*, *Coloquintida*, &c. *Loathsome* and of horrible taste; As in *Agarick*, *Blacke Hellebore*, &c. And of *secret Malignity*, and disagreement towards *Mans Body*, many times not appearing much in the Taste; As in *Scammony*, *Mechaocham*, *Antimony*, &c. And note well, that if there be any *Medicine*, that



that *Purgeth*, and hath neither of the first two *Manifest Qualities*; it is to be held suspected, as a kinde of *Poison*; For that it worketh either by *Corrosion*; or by a *secret Malignitie* and Enmity to *Nature*: And therefore such *Medicines* are warily to be prepared, and vsed. The *Quantity* of that which is taken, doth also cause *Purging*; as we see in a great *Quantity* of *New Milke* from the Cow; yea and a great *Quantity* of *Meat*; For *Surfets* many times turne to *Purges*, both vpwards, and downwards. Therefore we see generally, that the working of *Purging Medicines*, com-meth two or three houres after the *Medicines* taken; For that the *Stomacke* first maketh a prooffe, whether it can concoct them. And the like happeneth after *Surfets*; Or *Milke* in too great *Quantitie*.

A second *Cause* is *Mordication* of the *Orifices* of the *Parts*; Especial-ly of the *Mesentery veines*; As it is scene, that *Salt*, or any such thing that is sharpe and biting, put into the Fundament, doth prouoke the Part to expell; And *Mustard* prouoketh Sneezing: And any Sharpe Thing to the Eyes, prouoketh Teares. And therefore we see that almost all *Purgers* haue a kinde of *Twitching* and *vellication*, besides the *Gripping* which com-meth of wind. And if this *Mordication* be in an ouer-high Degree, it is little better than the *Corrosion* of *Poyson*; And it com-meth to passe sometimes in *Antimony*; Especially if it be giuen, to Bodies not repleat with Humors; For where Humors abound, the Humors saue the Parts.

The third *Cause* is *Attraction*: For I doe not deny, but that *Purging Medicines* haue in them a direct Force of *Attraction*; As *Drawing Plasters* haue in *Surgery*: And we see *Sage*, or *Bettony brused*, *Sneezing-powder*, and other *Powders* or *Liquors* (which the *Physicians* call *Errhines*;) put in-to the Nose, draw Flegme, and water from the Head; And so it is in *Apoplegmatisms*, and *Gargarismes*, that draw the Rheume downe by the Pallat. And by this Vertue, no doubt, some *Purgers* draw more one Hu-mour, and some another, according to the Opinion receiued: As *Rubarb* draweth Choller; *Sean* Melancholy; *Agarick* Flegme; &c. But yet, (more or lesse) they draw promiscuously. And note also, that besides Sympathy, betweene the *Purger* and the *Humour*, there is also another Cause, why some *Medicines* draw some Humour more than another. And it is, for that some *Medicines* worke quicker than others: And they that draw quicke, draw onely the Lighter, and more fluide Humours; they that draw slow, worke vpon the more Tough, and Viscous Hu-mours. And therefore Men must beware, how they take *Rubarb*, and the like, alone, familiarly; For it taketh only the Lightest part of the Hu-mour away, and leaueth the Masse of Humours more obstinate. And the like may be said of *Worme-wood*, which is so much magnified.

The fourth *Cause* is *Flatuosity*; For *Wind* stirred moueth to expell: And we finde that (in effect) all *Purgers* haue in them a raw *Spirit*, or *Wind*; which is the Principall Cause of *Tortion* in the *Stomack*, and *Belly*. And therefore *Purgers* leese (most of them) the vertue, by Decoction vpon the Fire; And for that Cause are giuen chiefly in Infusion, Iuyce, or Powder.

The



40

The fifth Cause is *Compression*, or *Crushing*: As when *Water* is Crushed out of a *Sponge*: So we see that *Taking Cold* moueth Loosenesse by Contraction of the Skinne, and outward Parts; And so doth *Cold* likewise cause Rheumes, and Defluxions from the Head; And some *Astringent Plasters* crush out purulent Matter. This kind of Operation is not found in many *Medicines*: *Mirabolanes* haue it; And it may be the *Barkes of Peaches*; For this Vertue requireth an *Astriction*; but such an *Astriction*, as is not gratefull to the Body: (For a pleasing *Astriction* doth rather Binde in the Humours, than Expell them:) And therefore such *Astriction* is found in Things of an Harriish Taste.

41

The Sixth Cause is *Lubrefaction*, and *Relaxation*. As wee see in *Medicines Emollient*; Such as are *Milke*, *Honey*, *Mallows*, *Lettuce*, *Mercuriall*, *Pelletory of the Wall*, and others. There is also a secret Vertue of *Relaxation* in *Cold*: For the *Heat* of the Body bindeth the Parts and Humours together, which *Cold* relaxeth: As it is scene in *Vrine*, *Blond*, *Pottage*, or the like; which, if they be *Cold*, breake, and dissolue. And by this kinde of *Relaxation*, *Feare* looseth the Belly; because the Heat retiring inwards towards the Heart, the Guts and other Parts are relaxed; In the same manner, as *Feare* also causeth Trembling in the Sinewes. And of this Kinde of *Purgers* are some *Medicines* made of *Mercury*.

42

The Seuenth Cause is *Absterion*; which is plainly a *Scouring off*, or *Incision* of the more viscos Humors, and making the *Humors* more fluide; And Cutting betweene them, and the Part. As is found in *Nitrous Water*, which scoureth Linnen Cloth (speedily) from the Foulensse. But this *Incision* must be by a *Sharpnesse*, without *Astriction*: Which wee finde in *Salt*, *Worme-wood*, *Oxymel*, and the like.

43

There be *Medicines*, that moue *Stooles*, and not *Vrine*; Some other, *Vrine*, and not *Stooles*. Those that *Purge by Stooles* are such as enter not at all, or little into the *Mesentery Veines*; But either at the first are not digestible by the *Stomacke*, and therefore moue immediatly downwards to the *Guts*; Or else are afterwards reiected by the *Mesentery Veines*, and so turne likewise downwards to the *Guts*; and of these two kinds are most *Purgers*. But those that moue *Vrine*, are such, as are well digested of the *Stomacke*, and well receiued also of the *Mesentery Veines*; So they come as farre as the *Liner*, which sendeth *Vrine* to the *Bladder*, as the *Whey* of *Bloud*: And those *Medicines* being Opening and Piercing, doe fortifie the Operation of the *Liner*, in sending downe the wheyey Part of the *Bloud* to the *Reines*. For *Medicines Vrinative* doe not worke by Reiection, and Indigestion, as *Solative* doe.

44

There be diuers *Medicines*, which in greater *Quantitie*, moue *Stooles*, and in smaller, *Vrine*: And so contrariwise, some that in greater *Quantity*, moue *Vrine*, and in smaller, *Stooles*. Of the former sort is *Rubarb*, and some others. The Cause is, for that *Rubarb* is a *Medicine*, which the *Stomacke* in a small *Quantity* doth digest, and overcome, (being not Flaruous, nor Loathsome;) and so sendeth it to the *Mesentery Veines*; And so being opening, it helpeth downe *Vrine*: But in a greater *Quantitie*, the



the *Stomacke* cannot overcome it, and so it goeth to the *Guts*. *Pepper* by some of the *Ancients* is noted to be of the second sort; which being in small *Quantitie*, moueth wind in the *Stomacke* and *Guts*, and so expelleth by *Stoole*; But being in greater *Quantitie*, dissipateth the *Wind*; And it selfe getteth to the *Mesentery veines*; And so to the *Liuver*, and *Reines*; where, by Heating and Opening, it sendeth downe *Urine* more plentifully.

**W**E haue spoken of *Euacuating* of the *Bodie*; we will now speake something of the *Filling* of it by *Restoratiues* in *Consumptions*, and *Emaciating Diseases*. In *Vegetables*, there is one part that is more *Nourishing* than another; As *Graines*, and *Roots* nourish more, than the *Leaues*; In so much as the *Order* of the *Foliatanes* was put downe by the *Pope*, as finding *Leaues* vnable to *Nourish* Mans *Body*. Whether there be that difference in the *Flesh* of *Living Creatures*, is not well inquired: As whether *Liuers*, and other *Entrailes*, be not more *Nourishing*, than the *Outward Flesh*. We finde that amongst the *Romans*, a *Gooses Liuer* was a great *Delicacy*; In so much as they had *Artificiall Meanes* to make it faire, and great; But whether it were more *Nourishing*, appeareth not. It is certaine, that *Marrow* is more *Nourishing* than *Fat*. And I conceiue that some *Decoction* of *Bones*, and *Sinewes*, stamped, and well strained, would be a very *Nourishing Brath*: VVee finde also that *Scotch Skincke*, (which is a *Pottage* of strong *Nourishment*,) is made with the *Knees*, and *Sinewes* of *Beefe*: but long boiled: *Jelly* also, which they vse for a *Restorative*, is chiefly made of *Knuckles* of *Veale*. The *Palpe* that is within the *Crafish* or *Crabb*, which they spice and butter, is more *Nourishing* than the *Flesh* of the *Crabb* or *Crafish*. The *Yolkes* of *Egges* are clearely more *Nourishing* than the *Whites*. So that it should seeme, that the *Parts* of *Living Creatures*, that lye more *Inwards*, nourish more than the *Outward Flesh*: Except it be the *Braine*; which the *Spirit* prey too much vpon, to leaue it any great *Vertue* of *Nourishing*. It seemeth for the *Nourishing* of *Aged Men*, or *Men* in *Consumptions*, some such thing should be *Deuised*; as should be halfe *Chylus*, before it be put into the *Stomacke*.

Take two large *Capons*; perboile them vpon a soft fire, by the space of an houre, or more, till in effect all the *Bloud* be gone. Adde in the *Decoction* the *Pill* of a *Sweet Limon*, or a good part of the *Pill* of a *Citron*, and a little *Mace*. Cut off the *Shanckes*, and throw them away. Then with a good strong *Chopping-knife*, mince the two *Capons*, bones and all, as small as ordinary *Minced Meat*; Put them into a large neat *Boulter*; Then take a *Kilderkin*, sweet, and well seasoned, of foure gallons of *Beere*, of *S. S.* strength, new as it commeth from the *Tunning*; Make in the *Kilderkin* a great *Bung-hole* of purpose: Then thrust into it, the *Boulter* (in which the *Capons* are) drawne out in length; Let it steepe in it three *Dayes*, and three *Nights*, the *Bung-hole* open, to worke; Then close the *Bung-hole*, and so let it continue, a *Day* and a halfe; Then draw

Experiments  
in *Confort*, touching  
*Meats*  
and *Drinks* that  
are most *Nourishing*.

45

46



draw it into Bottles, and you may drinke it well after three dayes Bottelling; And it will last six weekes (approved.) It drinketh fresh, floweth and mantleth exceedingly; It drinketh not newish at all; It is an excellent Drinke for a Consumption, to be drunke either alone, or Carded with some other beere. It quencheth Thirst, and hath no whit of windinesse. Note, that it is not possible, that Meat and Bread, either in Broths, or taken with Drinke, as is vsed, should get forth into the veines, and outward Parts, so finely, and easily, as when it is thus Incorporate, and made almost a *Chylus* aforehand.

47 Triall would be made of the like Brew with *Potado Roots*, or *Butte Roots*, or the *Pith* of *Artichokes*, which are nourishing Meats: It may be tried also, with other flesh; As *Pheasant*, *Partridge*, *Young Porke*, *Pigge*, *Venison*, especially of *young Deere*, &c.

48 A *Mortresse* made with the *Browne* of *Capons*, stamped, and strained, and mingled (after it is made) with like quantitie, (at the least,) of *Almond Butter*; is an excellent Meat to Nourish those that are weake; Better than *Blanc-Manger*, or *Jelly*: And so is the *Cullice* of *Cockes*, boyled thicke with the like Mixture of *Almond Butter*: For the *Mortresse*, or *Cullice*, of it selfe, is more Sauoury and strong; And not so fit for Nourishing of weake Bodies; But the *Almonds* that are not of so high a taste as *Flesh*, doe excellently qualifie it.

49 *Indian Mai* hath (of certaine) an excellent Spirit of Nourishment; But it must be thorowly boyled, and made into a *Mai-Cream* like a *Barley Cream*. I iudge the same of *Rize*, made into a Cream; For *Rize* is in *Turky*, and other Countries of the East, most fed vpon; But it must be thorowly boyled in respect of the Hardnesse of it: And also because otherwise it bindeth the Body too much.

50 *Pistachoes*, so they be good, and not mustie, ioyned with *Almonds* in *Almond Milke*; Or made into a *Milke* of themselues, like vnto *Almond Milke*, but more Greene, are an excellent Nourisher. But you shall doe well, to adde a little *Ginger*, scraped, because they are not without some subtil windinesse.

51 *Milke* warme from the Cow, is found to be a great Nourisher, and a good Remedic in *Consumptions*: But then you must put into it, when you milke the Cow, two little bagges; the one of *Powder* of *Mint*, the other of *Powder* of *Red Roses*; For they keepe the *Milke* somewhat from Turning, or Crudling in the stomacke; And put in Sugar also, for the same cause, and partly for the Tastes sake; But you must drinke a good draught that it may stay lesse time in the stomacke, lest it Crudle: And let the Cup into which you milke the Cow, be set in a greater Cup of hot water, that you may take it warme. And *Cow-milke* thus prepared, I iudge to be better for a *Consumption*, than *Asse-milke*, which (it is true) turneth not so easily, but it is a little harrish; Marry it is more proper for Sharpnesse of *Vrine*, and Exulceration of the Bladder, and all manner of Lenifyings. *Womans milke* likewise is prescribed, when all faile; but I commend it not; as being a little too neere the Iuyce of Mans



Mans Bodie, to be a good Nourisher; Except it be in *Infants*, to whom it is Naturall.

*Oyle of Sweet Almonds*, newly drawne, with *Sugar*, and a little *Spice*, spread vpon Bread toasted, is an Excellent Nourisher; But then to keepe the *Oyle* from frying in the Stomacke, you must drinke a good draught of *Milde Beere* after it; And to keepe it from relaxing the Stomack too much, you must put in a little Powder of *Cinnamon*.

The *Tolkes of Egges* are of themselves so well prepared by Nature for Nourishment; As (so they be Potched, or Reare boiled) they need no other Preparation, or Mixture; yet they may be taken also raw, when they are new laid, with *Malmesey*, or *Sweet wine*; You shall doe well to put in some few Slices of *Eryngium Roots*, and a little *Amber-grice*; For by this meanes, besides the immediate Facultie of Nourishment, such Drinke will strengthen the Backe; So that it will not draw downe the *Vrine* too fast; For too much *Vrine* doth alwayes hinder Nourishment.

*Mincing of meat*, as in *Pies*, and *buttered Minced Meat*, saue the Grinding of the Teeth; And therefore, (no doubt) it is more Nourishing; Especially in Age; Or to them that haue weake Teeth; But the Butter is not so proper for weake Bodies; And therefore it were good to moisten it with a little *Claret wine*, Pill of *Limon*, or *Orenge*, cut small, *Sugar*, and a very little *Cinamon*, or *Nutmegg*. As for *Chuets*, which are likewise minced Meat, in stead of Butter, and Fat, it were good to moisten them, partly with *Creame*, or *Almond*, or *Pistacho milke*; or *Barly*, or *Maiz Creame*; Adding a little *Coriander Seed*, and *Carraway Seed*, and a very little *Saffron*. The more full Handling of *Alimentation* we reserue to the due place.

We haue hitherto handled the Particulars which yeeld best, and easiest, and plentifullest Nourishment; And now we will speake of the best Meanes of Conueying, and Conuerting the Nourishment.

The First Meanes is, to procure that the Nourishment may not be robbed, and drawne away; wherein that, which we haue already said, is very Materiall; To prouide, that the *Reines* draw not too strongly an ouer-great Part of the *Bloud* into *Vrine*. To this adde that Precept of *Aristotle*, that *Wine* be forborne in all *Consumptions*; For that the *Spirits* of the *Wine*, doe prey vpon the *Roside Iuyce* of the Body, and inter-comunion with the *Spirits* of the Body, and so deceiue and rob them of their Nourishment. And therefore if the *Consumption* growing from the weaknesse of the Stomacke, doe force you to vse *Wine*; let it alwayes be burnt, that the Quicker *Spirits* may euaporate; or at the least quenched with two little wedges of *Gold*, six or seuen times repeated. Adde also this Prouision, That there be not too much *Expence* of the Nourishment, by *Exhaling*, and *Sweating*; And therefore if the Patient be apt to sweat, it must be gently restrained. But chiefly *Hippocrates Rule* is to be followed; who aduiseeth quite contrary to that which is in vse: Namely, that the *Linnen*, or *Garment* next the *Flesh*, be in Winter drie, and oft changed;



changed; And in Sommer seldome changed, and smeared ouer with Oyle; For certaine it is, that any Substance that is fat, doth a little fill the Pores of the Body, and stay Sweat, in some Degree. But the more cleanly way is, to haue the *Linnen* smeared lightly ouer, with Oyle of *Sweet Almonds*; And not to forbear shifting as oft as is fit.

56

The Second *Meanes* is, to send forth the *Nourishment* into the *Parts*, more strongly; For which, the working must be by *Strengthening* of the *Stomack*; And in this, because the *Stomack* is chiefly comforted by *Wine*, and *Hot things*, which otherwise hurt; it is good to resort to *Outward Applications* to the *Stomack*: VWherein it hath beene tried, that the *Quilts* of *Roses*, *Spices*, *Mastick*, *Worme-wood*, *Mint*, &c. are nothing so helpfull, as to take a *Cake* of *New bread*, and to bedew it with a little *Sack*, or *Ale-gant*; And to drie it; And after it be dried a little before the Fire, to put it within a cleane Napkin, and to lay it to the *Stomacke*: For it is certaine, that all Flower hath a potent Vertue of *Astriction*; In so much as it hardneth a peece of flesh, or a Flower, that is laid in it: And therefore a *Bagge* quilted with *Bran*, is likewise very good; but it drieth somewhat too much; and therefore it must not lye long.

57

The third *Meanes* (which may be a Branch of the former) is to send forth the *Nourishment* the better by *Sleepe*. For we see, that Beares, and other *Creatures* that *sleepe* in the Winter, wax exceeding fat: And certaine it is, (as it is commonly beleeued) that *Sleepe* doth Nourish much; Both for that the Spirits do lesse spend the Nourishment in *Sleepe*, then when liuing *Creatures* are awake: And because (that which is to the present purpose) it helpeth to thrust out the Nourishment into the *Parts*. Therefore in Aged men, and weake Bodies, and such as abound not with Choller, a short *Sleepe* after dinner doth helpe to Nourish; For in such Bodies there is no feare of an ouer-hastie Digestion, which is the Inconuenience of Postmeridian *Sleepes*. *Sleepe* also in the Morning, after the taking of somewhat of easie Digestion; As *Milke* from the Cow, *Nourishing Broth*, or the like; doth further Nourishment: But this would be done, sitting vpright, that the *Milke* or *Broth* may passe the more speedily to the bottome of the *Stomacke*.

58

The Fourth *Meanes* is to provide that the *Parts* themselves may draw to them the Nourishment strongly. There is an Excellent Obseruation of *Aristotle*; That a great Reason, why Plants (some of them) are of greater Age, than *Liuing Creatures*, is, for that they yearly put forth new Leaues, and Boughes; whereas *Liuing Creatures* put forth (after their Period of Growth,) nothing that is young, but Haire and Naitles; which are Excrements, and no *Parts*. And it is most certaine, that whatsoever is young, doth draw Nourishment better, than that which is Old; And then (that which is the Mytery of that Obseruation) young Boughes, and Leaues, calling the Sap vp to them; the same Nourisheth the *Body*, in the Passage. And this we see notably proued also, in that the oft Cutting, or Polling of *Hedges*, *Trees*, and *Herbs*, doth conduce much to their Lasting. Transferrre therefore this Obseruation to the

Helping



Helping of Nourishment in *Living Creatures*: The Noblest and Principall Vse whereof is, for the *Prolongation of Life*; *Restoration* of some Degree of *Youth*; and *Inteneration* of the *Parts*: For certaine it is, that there are in *Living Creatures* Parts that Nourish, and Repaire easily; And Parts that Nourish and repaire hardly, And you must refresh, and renew those that are easie to Nourish, that the other may be refreshed, and (as it were) Drinke in Nourishment, in the Passage. Now we see that *Draught Oxen*, put into good Pasture, recouer the Flesh of young Beefe; And Men after long Emaciating Diets, waxe plump, and fat, and almost New: So that you may surely conclude, that the frequent and wise Vse of those *Emaciating Diets*, and of *Purgings*; And perhaps of some kind of *Bleeding*; is a principall Meanes of *Prolongation of Life*; and *Restoring* some Degree of *Youth*: For as we haue often said, *Death* commeth vpon *Living Creatures* like the Torment of *Mezentius*;

*Mortua quinetiam iungebat Corpora vniu.*

*Componens Manibusq; Manus, atq; Oribus Ora.*

For the Parts in Mans Body easily reparable (as *Spirits*, *Blood*, and *Flesh*) die in the Embrace of the Parts hardly reparable (as *Bones*, *Nerves*, and *Membranes*;) And likewise some *Entrails* (which they reckon amongst the *Spermatieall Parts*) are hard to repaire: Though that Diuision of *Spermatieall*, and *Menstruall Parts*, be but a Conceit. And this same *Observation* also may be drawne to the present purpose of Nourishing Emaciated Bodies: And therefore *Gentle Friction* draweth forth the Nourishment, by making the Parts a little hungry, and heating them; whereby they call forth Nourishment the better. This *Friction* I wish to be done in the Morning. It is also best done by the *Hand*, or a peece of *Scarlet Wooll*, wet a little with *Oile of Almonds*, mingled with a small Quantity of *Bay-salt*, or *Saffron*. We see that the very Currying of Horses doth make them fat, and in good liking.

The Fifth Meanes is, to further the very *Act* of *Assimilation* of *Nourishment*; which is done by some outward *Emollients*, that make the Parts more apt to *Assimilate*. For which I haue compounded an *Ointment* of Excellent Odour, which I call *Roman Ointment*, *vide* the *Receit*. The vse of it would be betweene Sleepes; For in the latter Sleepe the Parts *Assimilate* chiefly.

There be many *Medicines*, which by themselves would doe no Cure, but perhaps Hurt; but being applied in a certaine Order, one after another, doe great Cures. I haue tried (my selfe) a *Remedy* for the *Gout*, which hath seldome failed, but driuen it away in 24. Houres space: It is first to apply a *Pulsaſſe*, of which *vide* the *Receit*; And then a *Bath* or *Fomentation*, of which *vide* the *Receit*; And then a *Plaister*, *vide* the *Receit*. The *Pulsaſſe* relaxeth the Pores, and maketh the Humour apt to Exhale. The *Fomentation* calleth forth the Humour by Vapours; But yet in regard of the way made by the *Pulsaſſe*, Draweth gently; And therefore draweth the Humour out; and doth not draw more to it; For it

Experiment  
Solitary touching  
Filum  
Medicinale.



is a *Gentle Fomentation*, and hath withall a Mixture (though very little) of some *Stupefactine*. The *Plaster* is a Moderate *Astringent Plaster*, which repelleth New Humour from falling. The *Pultasse* alone would make the Part more soft, and weake; And apter to take the Defluxion and Impression of the Humour. The *Fomentation* alone, if it were too weake, without way made by the *Pultasse*, would draw forth little; If too strong, it would draw to the Part, as well as draw from it. The *Plaster* alone, would pen the Humour already contained in the Part, and so exasperate it, as well as forbid new Humour. Therefore they must be all taken in Order, as is said. The *Pultasse* is to be laid to for two or three Houres: The *Fomentation* for a Quarter of an Houre, or somewhat better, being vsed hot, and seuen or eight times repeated: The *Plaster* to continue on still, till the Part be well confirmed.

Experiment  
Solitary tou-  
ching Cure by  
Custome.

61

**T** Here is a secret Way of Cure (vnpractized;) By *Assuetude* of that which in it selfe hurteth. *Poisons* haue bin made, by some, Familiar, as hath beene said, *Ordinary keepers* of the *Sicke* of the *Plague*, are sel- dome infected. *Enduring of Torture*, by *Custome*, hath beene made more easie: The *Brooking* of Enormous *Quantity* of *Meats*, and so of *Wine* or *Strong Drinke*, hath beene, by *Custome*, made to be without *Surfet*, or *Drunkennesse*. And generally *Diseases* that are *Chronicall*, as *Coughes*, *Phthisickes*, some kinds of *Palsies*, *Lunacies*, &c. are most dangerous at the first: Therefore a wise *Physitian* will consider whether a *Disease* be Incurable; Or whether the Iust Cure of it be not full of perill; And if hee finde it to bee such, let him resort to *Palliation*; And alleuiate the *Symptome*, without busying himselfe too much with the perfect *Cure*: And many times, (if the *Patient* be indeed patient) that Course will exceed all Expectation. Likewise the *Patient* himselfe may strue, by little and little, to Overcome the *Symptome*, in the Exacerbation, and so, by time, turne Suffering into Nature.

Experiment  
Solitary tou-  
ching Cure by  
Excesse.

62

**D** iuers *Diseases*, especially *Chronicall* (such as *Quartan Agues*;) are sometimes cured by *Surfet*, and *Excesses*; As *Excesse of Meat*, *Excesse of Drinke*, *Extraordinary Fasting*, *Extraordinary Stirring*, or *Lassitude*, and the like. The Cause is, for that *Diseases* of *Continuance* get an *Aduentitious Strength* from *Custome*, besides their *Materiall Cause* from the *Humours*: So that the *Breaking* of the *Custome* doth leaue them only to their first *Cause*; which if it be any thing weake will fall off. Besides, such *Excesses* do Excite and Spur *Nature*, which thereupon riseth more forcibly against the *Disease*.

Experiment  
Solitary tou-  
ching Cure by  
Motion of Con-  
sent.

63

**T** Here is in the Body of Man a great *Consent* in the *Motion* of the seuerall Parts. We see, it is Childrens sport, to proue whether they can rub vpon their Brest with one hand, and pat vpon their Fore-head with another; And straight-waies, they shall sometimes rub with both Hands, or pat with both hands. We see, that when the Spirits, that cometo the Nostrils, expella bad Sent, the Stomach is ready to Ex-  
pell



pell by Vomit. We finde that in *Consumptions* of the *Lungs*, when Nature cannot expell by *Cough*, Men fall into *Fluxes* of the *Belly*, and then they die. So in *Pestilent Diseases*, if they cannot be expelled by *Sweat*, they fall likewise into *Loosenesse*, and that is commonly *Mortall*. Therefore *Physitians* should ingeniously contriue, how by *Motions* that are in their *Power*, they may excite *Inward Motions* that are not in their *Power*, by *Consent*: As by the *Stench* of *Feathers*, or the like, they cure the *Rising* of the *Mother*.

**H**ippocrates *Aphorisme*, In *Morbis minus*, is a good profound *Aphorisme*. It importeth, that *Diseases*, contrary to the *Complexion*, *Age*, *Sex*, *Season of the yeere*, *Diet*, &c. are more dangerous, than those that are *Concurrent*. A man would thinke it should be otherwise; For that, when the *Accident of Sicknesse*, and the *Naturall Disposition*, doe second the one the other, the *Disease* should be more forcible: And so (no doubt) it is; if you suppose like *Quantity of Matter*. But that, which maketh good the *Aphorisme*, is; Because such *Diseases* doe shew a greater *Collection of Matter*, by that they are able to overcome those *Naturall Inclinations* to the *Contrary*. And therefore in *Diseases* of that kinde, let the *Physitian* apply himselfe more to *Purgation*, than to *Alteration*; Because the *Offence* is in the *Quantity*; and the *Qualities* are rectified of themselves.

**P**hytians doe wisely prescribe, that there be *Preparatives* vsed before *Iust Purgations*; For certaine it is, that *Purgers* doe many times great Hurt, if the *Body* be not accommodated, both before and after the *Purging*. The Hurt that they doe, for want of *Preparation* before *Purging*, is by the *Sticking* of the *Humours*, and their not comming faire away; Which causeth in the *Body* great *Perturbations*, and ill *Accidents*, during the *Purging*; And also, the diminishing, and dulling of the *Working* of the *Medicine* it selfe, that it purgeth not sufficiently. Therefore the worke of *Preparation* is double; To make the *Humours* *fluide*, and mature; And to make the *Passages* more open: For both those helpe to make the *Humours* passe readily. And for the former of these, *Sirrups* are most profitable; And for the Latter, *Apozymes*, or *Preparing Broths*; *Clisters* also helpe, lest the *Medicine* stop in the *Guts*, and worke gripingly. But it is true, that *Bodies abounding with Humours*; And *fat Bodies*; And *Open weather*; are *Preparatives* in themselves; because they make the *Humours* more *fluide*. But let a *Physitian* beware, how he purge after hard *Frosty Weather*, and in a *Leane Body*, without *Preparation*. For the Hurt, that they may doe after *Purging*; It is caused by the *Lodging* of some *Humours* in ill *Places*: For it is certaine, that there be *Humours*, which somewhere placed in the *Body*, are quiet, and doe little hurt; In other *Places* (especially *Passages*) doe much mischief. Therefore it is good, after *Purging*, to vse *Apozymes*, and *Broths*, not so much *Opening* as those vsed before *Purging*, but *Absterfing* and

Experiment  
Solitary touching  
Care of  
Diseases which  
are contrary to  
Pred. disposition.

64

Experiment  
Solitary touching  
Preparations before  
Purging, and  
settling of the  
Body afterward.

65



*Mundifying Clifters* also are good to conclude with, to draw away the Reliques of the Humours, that may have descended to the *Lower Region* of the Body.

Experiment  
Solitary touch-  
ing Stanch-  
ing of Bloud.

66

**B**lood is stanch'd diuers waies. First by *Astringents*, and *Repercussive Medicines*. Secondly, by *Drawing* of the *Spirits* and *Bloud* inwards; which is done by *Cold*; As *Iron*, or a *Stone* laid to the neck doth stanch the Bleeding at the Nose; Also it hath beene tried, that the *Testicles*, being put into sharpe Vinegar, hath made a sudden Recess of the *Spirits*, and stanch'd Bloud. Thirdly, by the *Recess of the Bloud* by *Sympathy*. So it hath beene tried, that the part that bleedeth, being thrust into the Body of a Capon, or Sheepe, new ripe and bleeding, hath stanch'd *Bloud*; The *Bloud*, as it seemeth, sucking and drawing vp, by similitude of substance, the *Bloud* it meeteth with, and so it selfe going backe. Fourthly by *Custom* and *Time*; So the Prince of *Aurange*, in his first hurt, by the *Spanish Boy*, could find no meanes to stanch the *Bloud*, either by *Medicine* or *Ligament*; but was faine to haue the *Orifice* of the *Wound* stopped by *Mens Thumbs*, succeeding one another, for the space at least of two Daies; And at the last the bloud by *Custom* only retired. There is a fifth Way also in vse, to let *Bloud* in an *Adverse Part*, for a *Revolucion*.

Experiment  
Solitary touch-  
ing Change of  
Aliments and  
Medicines.

67

**I**T helpeth, both in *Medicine*, and *Aliment*, to Change and not to continue the same *Medicine*, and *Aliment* still. The Cause is, for that *Nature* by continuall Vse of any Thing, groweth to a *Society*, and *Dulnesse*, either of *Appetite*, or *Working*. And we see that *Assuetude* of *Things Hurtfull* doth make them leese their force to Hurt; As *Poison*, which with vse some haue brought themselves to brooke. And therefore it is no maruell, though *Things helpfull*, by *Custom*, leese their force to Helpe. I count *Intermission* almost the same thing with *Change*; For that, that hath beene intermitted, is after a sort new.

Experiment  
Solitary touch-  
ing Diets.

68

**I**T is found by Experience; that in *Diets* of *Guaiaicum*, *Sarza*, and the like (especially if they be strict) the *Patient* is more troubled in the beginning, than after continuance; which hath made some of the more delicate Sort of patients, giue them over in the midst; Supposing that if those *Diets* trouble them so much at first, they shall not be able to endure them to the End. But the Cause is, for that all those *Diets*, doe dry vp *Humors*, *Rheumes*, and the like; And they cannot Drie vp vntill they haue first attenuated; And while the *Humour* is attenuated, it is more Fluid, than it was before, and troubleth the Body a great deale more, vntill it be dried vp, and consumed. And therefore *Patients* must expect a due time, and not checke at them at the first.

Experiments  
in Confort  
touching the  
Production of  
Cold.

The Producing of Cold is a thing very worthy the Inquisition; both for Vse, and Disclosure of Causes. For Heat and Cold



*Cold* are *Natures* two Hands, whereby shee chiefly worketh: And *Heat* we haue in readinesse, in respect of the *Fire*; But for *Cold* we must stay till it commeth; or seeke it in deepe Caues, or high Mountaines: And when all is done, we cannot obtaine it in any great degree: For *Furnaces* of *Fire* are farre hotter, than a *Summers Sunne*; But *Vaults*, or *Hils* are not much Colder than a *Winters Frost*.

The first *Meanes* of *Producing Cold*, is that which *Nature* presenteth vs withall; Namely the *Expiring of Cold* out of the *Inward Parts* of the *Earth* in *Winter*, when the *Sun* hath no power to ouercome it; the *Earth* being (as hath been noted by some) *Primum Frigidum*. This hath beene asserted, as well by *Ancient* as by *Moderne Philosophers*: It was the Tenet of *Parmenides*. It was the opinion of the *Author* of the discourse in *Plutarch* (for I take it that Booke was not *Plutarchs* owne) *De primo Frigido*. It was the opinion of *Telesius*, who hath renewed the *Philosophy* of *Parmenides*, and is the best of the *Nonellists*.

The Second *Cause* of *Cold* is the *Contact* of *Cold Bodies*; For *Cold* is *Active* and *Transitive* into *Bodies* *Adiacent*, as well as *Heat*: which is seene in those things that are touched with *Snow* or *Cold water*. And therefore, whosoeuer will be an *Inquirer* into *Nature*, let him resort to a *Conseruatory* of *Snow* and *Ice*; Such as they vse for delicacy, to coole *Wine* in *Summer*: Which is a *Poore* and *Contemptible* vse, in respect of other vses, that may be made of such *Conseruatories*.

The Third *Cause* is the *Primary Nature* of all *Tangible bodies*: For it is well to be noted, that all Things whosoeuer (*Tangible*) are of themselves *Cold*; Except they haue an *Accessory Heat* by *fire*; *Life*; or *Motion*: For euen the *Spirit* of *Wine*, or *Chymicall Oiles*, which are so hot in *Operation*, are to the first Touch *Cold*; And *Aire* it selfe compressed, and *Condensed* a little by blowing, is *Cold*.

The Fourth *Cause* is the *Density* of the *Body*; For all *Dense Bodies* are *Colder* than most other *Bodies*; As *Metals*, *Stone*, *Glasse*; And they are longer in *Heating* than *Softer Bodies*. And it is certaine, that *Earth*, *Dense*, *Tangible*, hold all of the *Nature* of *Cold*. The *Cause* is, for that all *Matters Tangible* being *Cold*, it must needs follow, that where the *Matter* is most *Congregate*, the *Cold* is the greater.

The Fifth *Cause* of *Cold*, or rather of increase and vehemence of *Cold*, is a *Quicke Spirit* inclosed in a *Cold Body*: As will appeare to any that shall attentively consider of *Nature* in many Instances. We see *Nitre* (which hath a *Quicke Spirit*) is *Cold*; more *Cold* to the Tongue, than a *Stone*; So *Water* is *Colder* than *Oile*, because it hath a *Quicker Spirit*; For all *Oile*, though it hath the *Tangible Parts* better digested than *Water*, yet hath it a duller *Spirit*: So *Snow* is *Colder* than *Water*, because it hath more *Spirit* within it: So we see that *Salt* put to *Ice* (as in the producing of the *Artificiall Ice*) increaseth the *Actiuitie* of *Cold*: So some *Insecta* which haue

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*Spirit of Life*, as *Snakes*, and *Silkwormes*, are, to the touch, *Cold*. So *Quick-silver* is the *Coldest* of *Mettals*, because it is *fullest of Spirit*.

74

The *Sixth Cause of Cold* is the *Chasing and Driving away of Spirits*, such as haue some *Degree of Heat*: For the *Banishing of the Heat* must needs leaue any *Body Cold*. This we see in the *Operation of Opium*, and *Stupéfactions*, vpon the *Spirits of living Creatures*: And it were not amisse to try *Opium*, by laying it vpon the *Top of a Weather-glasse*, to see whether it will contract the *Aire*: But I doubt it will not succeed: For besides that the vertue of *Opium* will hardly penetrate thorow such a *Body as Glasse*, I conceiue that *Opium*, and the like, make the *Spirits* flie rather by *Malignity*, than by *Cold*.

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Seuenthly, the same *Effect* must follow vpon the *Exhaling or Drawing out of the warme Spirits*, that doth vpon the *Flight of the Spirits*. There is an *Opinion*, that the *Moone* is *Magneticall of Heat*, as the *Sun* is of *Cold* and *Moisture*: It were not amisse therefore to try it, with *Warne waters*; The one exposed to the *Beames of the Moone*; the other with some *Skreen* betwixt the *Beames of the Moone* and the *Water*; As we vse to the *Sunne* for *Shade*; And to see whether the former will coole sooner. And it were also good to enquire, what other *Meanes* there may be, to draw forth the *Exile heat*, which is in the *Aire*; for that may be a *Secret of great Power* to Produce *Cold weather*.

Experiments  
in Consort  
touching the  
Version and  
Transmutation  
of Aire into Wa-  
ter.

We haue formerly set downe the *Meanes of turning Aire into water*, in the *Experiment 27*. But because it is *Magnale Nature*; And tendeth to the subduing of a very great effect; And is also of *Manifold vse*; we will adde some *Instances in Consort* that giue light thereunto.

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It is reported by some of the *Ancients*, that *Sailers* haue vsed, euery Night, to hang *Fleeces of wooll* on the sides of their *Ships*, the *Wooll* towards the water; And that they haue crushed fresh *Water* out of them, in the Morning, for their vse. And thus much wee haue tried, that a *Quantity of Wooll* tied loose together, being let downe into a deepe *Well*; And hanging in the *Middle*, some three *Fathome* from the water, for a night, in the *Winter time*; increased in weight, (as I now remember) to a fifth Part.

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It is reported by one of the *Ancients*, that in *Lydia*, neere *Pergamus*, there were certaine *Work-men*, in time of *Warres*, fled into *Caves*; And the Mouth of the *Caves* being stopped by the *Enemies*, they were famished. But long time after the dead *Bones* were found; And some *Vessels* which they had carried with them; And the vessels full of *Water*; And that *Water*, thicker, and more towards *Ice*, than *Common Water*: which is a *Notable Instance of Condensation*, and *Induration*, by *Buriall vnder Earth*, (in *Caves*) for long time; And of *version* also (as it should seeme) of *Aire* into *Water*; if any of those vessels were *Emptie*. Trie therefore a small *Bladder* hung in *Snow*; And the like in *Nitre*; And the like



like in *Quick-silver*: And if you finde the *Bladders* fallen, or shrunk; you may be sure the *Aire* is condensed by the *Cold* of those *Bodies*; As it would be in a *Cane* vnder *Earth*.

It is reported of very good credit, that in the *East Indies*, if you set a Tub of *Water* open, in a Roome where *Clones* are kept, it will be drawne drie in foure and twenty houres; Though it stand at some distance from the *Clones*. In the Countrey, they vse many times, in deceit, when their *wooll* is new shorne, to set some *Pail* of *Water* by, in the same Roome; to increase the weight of the *wooll*: But it may be, that the Heat of the *wooll*, remaining from the body of the *Sheepe*; or the Heat gathered by the lying close of the *wooll*, helpeth to draw the watry Vapour; But that is nothing to the *Version*.

It is Reported also credibly, that *wooll* new shorne, being laid casually vpon a *Vessell* of *Veriuyce*, after some time, had drunke vp a great part of the *Veriuyce*, though the *Vessell* were whole without any *Flaw*, and had not the Bung-hole open. In this *Instance*, there is (vpon the by) to be noted, the *Percolation*, or *Suing* of the *Veriuyce* thorow the wood; For *Veriuyce* of it selfe would neuer haue passed thorow the wood: So as, it seemeth, it must be first in a kinde of Vapour, before it passe.

It is especially to be noted, that the Cause, that doth facilitate the *Version* of *Aire* into *Water*, when the *Aire* is not in grosse, but subtilly mingled with *Tangible Bodies*, is, (as hath beene partly touched before,) for that *Tangible Bodies* haue an Antipathy with *Aire*; And if they finde any *Liquid Body*, that is more dense, neare them, they will draw it: And after they haue drawne it, they will condense it more, and in effect incorporate it; For we see that a *Sponge*, or *wooll*, or *Sugar*, or a *woollen cloth*, being put but in part, in *Water*, or *Wine*, will draw the *Liquor* higher, and beyond the place, where the *Water* or *Wine* commeth. We see also, that *Wood*, *Lute-strings*, and the like, doe swell in *moist Seasons*: As appeareth by the *Breaking* of the *Strings*, the *Hard Turning* of the *Pegs*, and the *Hard drawing forth* of *Boxes*, and *Opening* of *Wainscot doores*; which is a kinde of *Infusion*: And is much like to an *Infusion* in water, which will make wood to swell: As we see in the *Filling* of the *Chops* of *Boules*, by laying them in water. But for that part of these *Experiments*, which concerneth *Attraction*; we will reserue it to the proper *Title* of *Attraction*.

There is also a *Version* of *Aire* into water, scene in the *Sweating* of *Marbles*, and other *Stones*. And of *Wainscot* before and in moist weather: This must be, either by some *Moisture* the Body yeeldeth; Or else by the Moist *Aire* thickned against the hard body. But it is plaine, that it is the latter; For that we see *Wood painted with Oyle Colour*, will sooner gather droppes in a moist Night, than *Wood* alone: which is caused by the Smoothnesse and Closenesse; which letteth in no part of the Vapour, and so turneth it backe, and thickeneth it into Dew. We see also, that *Breathing* vpon a *Glasse*, or Smooth body, giueth a Dew; And in *Frosty Mornings* (such as we call *Rime frosts*) you shall finde drops of Dew vpon the

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the Inside of Glasse-windowes; And the *Frost* it selfe vpon the ground is but a *Version* or *Condensation*, of the Moist vapours of the Night, into a watric substance: *Dewes* likewise, and *Raine*, are but the Returnes of Moist vapours Condensed; The Dew, by the *Cold* only of the Sunnes departure, which is the gentler *Cold*; *Raines*, by the *Cold* of that, which they call the *Middle Region* of the *Aire*; which is the more violent *Cold*.

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It is very probable (as hath beene touched) that that, which will turne *Water* into *Ice*, will likewise turne *Aire* Some Degree nearer vnto *Water*. Therefore trie the *Experiment* of the *Artificiall Turning water into Ice* (whereof we shall speake in another place) with *Aire* in place of *Water*, and the *Ice* about it. And although it be a greater Alteration to turne *Aire* into *Water*, than *Water* into *Ice*: yet there is this Hope, that by Continuing the *Aire* longer time, the effect will follow; For that *Artificiall Conversion* of *Water* into *Ice*, is the worke of a few Houres; And this of *Aire* may be tried by a Moneths space, or the like.

Experiments  
in Consort,  
touching Indu-  
ration of Bodies.

*Induration*, or *Lapidification*, of Substances more soft, is likewise another degree of *Condensation*; And is a great *Alteration* in Nature. The Effecting and Accelerating thereof is very worthy to be inquired. It is effected by three Meanes. The first is by *Cold*; whose Property is to *Condense*, and constipate, as hath beene said. The Second is by *Heat*; which is not proper, but by consequence; For the *Heat* doth attenuate; And by Attenuation doth send forth the Spirit and moister Part of a Body; And vpon that, the more grosse of the Tangible Parts doe contract and ferre themselues together; Both to Auoid *Vacuum* (as they call it;) And also to Munit themselues against the Force of the *Fire*, which they haue suffered. And the Third is by *Assimilation*; when a Hard Body Assimilateth a Soft, being contiguous to it.

The Examples of *Induration*, taking them promiscuously, are many: As the Generation of *Stones* within the Earth, which at the first are but Rude Earth, or Clay: And so of *Mineralls*, which come (no doubt) at first, of Iuyces Concrete, which afterward indurate: And so of *Porcellane*, which is an *Artificiall Cement*, buried in the earth a long time: And so the Making of *Bricke*, and *Tile*: Also the Making of *Glasse*, of a certaine Sand, and Brake-Roots, and some other Matters: Also the *Exudations* of *Rock-Diamonds*, and *Cry stall*, which harden



den with time: Also the *Induration* of *Bead-Amber*, which at first is a soft Substance; As appeareth by the *Flies*, and *Spiders*, which are found in it; And many more: But wee will speake of them distinctly.

For *Indurations* by *Cold*, there be few *Trialls* of it; For we haue no strong or intense *Cold* here on the Surface of the *Earth*, so neare the Beames of the *Sunne*, and the *Heauens*. The likeliest *Triall* is by *Snow*, and *Ice*; For as *Snow* and *Ice*, especially being holpen, and their *Cold* actuated by *Nitre*, or *Salt*, will turne *Water* into *Ice*, and that in a few houres; So it may be, it will turne *Wood*, or *Stiffe Clay*, into *Stone*, in longer time. Put therefore, into a *Conserving Pit* of *Snow*, and *Ice*, (adding some quantitie of *Salt*, and *Nitre*,) a *Peece* of *Wood*, or a *Peece* of *Tough Clay*, and let it lye a *Moneth*, or more.

Another *Triall* is by *Metalline Waters*, which haue virtuall *Cold* in them. Put therefore *Wood*, or *Clay*, into *Smiths Water*, or other *Metalline Water*; And try wheether it will not harden in some reasonable time. But I vnderstand it, of *Metalline Waters*, that come by *Washing*, or *Quenching*; And not of *Strong Waters* that come by dissolution; for they are too *Corrosiue* to consolidate.

It is already found, that there are some *Naturall Spring-waters*, that will *Inlapidate Wood*; So as you shall see one peece of *Wood*, whereof the Part about the *Water* shall continue *Wood*; and the Part vnder the *Water* shall be turned into a kinde of *Granelly Stone*. It is likely those *Waters* are of some *Metalline Mixture*; But there would be more particular *Inquiry* made of them. It is certaine, that an *Egge* was found, hauing lien many yeeres in the bottome of a *Moat*, where the *Earth* had somewhat ouer-growne it; And this *Egge* was come to the *Hardnesse* of a *Stone*; And had the *Colours* of the white and yolke perfect: And the *Shell* shining in small graines like *Sugar*, or *Alabaster*.

Another *Experience* there is of *Induration* by *Cold*, which is alreadie found; which is, that *Metalls*, themselues are hardened by often *Heating* and *Quenching* in *Cold Water*: For *Cold* euer worketh most potently vpon *Heat* precedent.

For *Induration* by *Heat*, it must be considered, that *Heat*, by the *Exhaling* of the *Moister Parts*, doth either harden the *Body*; As in *Brickse*, *Tiles*, &c. Or if the *Heat* be more fierce, maketh the grosser part it selfe, *Runne* and *Melt*; As in the making of ordinary *Glasse*; And in the *Vitrification* of *Earth*, (As we see in the *Inner Parts* of *Furnaces*;) and in the *Vitrification* of *Bricke*; And of *Metalls*. And in the former of these, which is the *Hardening* by *baking*, without *Melting*, the *Heat* hath these degrees; First it *Indurath*; and then maketh *Fragile*; And lastly it doth *Incinerate* and *Calcinate*.

But if you desire to make an *Induration* with *Toughnesse*, and lesse *Fragilitie*; A middle way would be taken; Which is that which *Aristotle* hath well noted; But would be thoroughly verified. It is, to decoct *Bodies*



in *Water*, for two or three dayes; But they must be such Bodies, into which the *Water* will not enter; As *Stone*, and *Metall*. For if they be Bodies into which the *Water* will enter, then long Seething, will rather Soften than indurate them. As hath beene tried in *Egges* &c. Therefore, Softer Bodies must be put into Bottles; And the Bottles hung into *Water* seething, with the mouths open, above the *Water*; that no *Water* may get in; For by this Meanes, the virtuall *Heat* of the *Water* will enter; And such a *Heat*, as will not make the Bodie adust, or fragile; But the Substance of the *Water* will be shut out. This Experiment wee made; And it sorted thus. It was tried with a Peece of *Free-stone*, and with *Pewter*, put into the *Water* at large. The *Free-stone* we found receiued in some *Water*; For it was softer, and easier to scrape, than a peece of the same *Stone* kept drie. But the *Pewter* into which no *Water* could enter, became more white, and liker to *Siluer*, and lesse flexible, by much. There were also put into an Earthen Bottle, placed as before, a good Pellet of *Clay*, a Peece of *Cheese*, a Peece of *Chalke*, and a Peece of *Free-stone*. The *Clay* came forth almost of the Hardnesse of *Stone*. The *Cheese* likewise very hard, and not well to be cut: The *Chalke* and the *Free-stone* much harder than they were. The colour of the *Clay* inclined not a whit to the Colour of *Bricke*, but rather to *White*, as in ordinary Drying by the Sunne. Note, that all the former Trialls were made by a Boyling vpon a good hot Fire, renewing the *Water* as it consumed, with other hot *Water*; But the Boyling was but for twelue houres onely; And it is like that the Experiment would haue beene more effectually, if the Boyling had beene for two or three dayes, as we prescribed before.

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As touching *Assimilation*, (for there is a degree of *Assimilation* euen in Inanimate bodies) we see Examples of it in some *Stones* in *Clay-grounds*, lying neare to the top of the Earth, where *Pebble* is; In which you may manifestly see diuers *Pebbles* gathered together, and a Crust of *Cement* or *Stone* betweene them, as hard as the *Pebbles* themselues: And it were good to make a Triall of purpose, by taking *Clay*, and putting in it diuers *Pebble-Stones*, thicke set, to see whether in continuance of time, it will not be harder than other *Clay* of the same lumpe, in which no *Pebbles* are set. We see also in Ruines of old Walls, especially towards the bottome, the *Mortar* will become as hard as the *Bricke*; we see also, that the *Wood* on the sides of *Vessels* of *Wine*, gathereth a Crust of *Tartar*, harder than the *Wood* it selfe; And Scales likewise grow to the *Teeth*, harder than the *Teeth* themselues.

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Most of all, *Induration* by *Assimilation* appeareth in the Bodies of *Trees*, and *living Creatures*: For no Nourishment that the *Tree* receiueth, or that the *living Creature* receiueth, is so hard as *Wood*, *Bone*, or *Horne*, &c. but is *Indurated* after by *Assimilation*.

Experiment  
Solitary touching the  
Version of Water into  
Aire.

91

The eie of the vnderstanding, is like the eie of the Sense: For as you may see great Obiects thorow small Crannies, or Leuells; So you may



may see great *Axiomes* of *Nature*, through small and Contemptible *Instances*. The *Speedy Depredation* of *Aire* vpon watry *Moisture*, and *Version* of the same into *Aire*, appeareth in nothing more visible, than in the sudden *Discharge*, or vanishing, of a little *Cloud* of *Breath*, or *Vapour*, from *Glasse*, or the *Blade* of a *Sword*, or any such Polished Body; Such as doth not at all *Detaine*, or *Imbibe* the *Moisture*; For the *Mistmeffe* scattereth and breaketh vp suddenly. But the like *Cloud*, if it were *Oyle*, or *Fattie*, will not discharge; Not because it sticketh faster; But because *Aire* preyeth vpon *Water*; And *Flame*, and *Fire*, vpon *Oyle*; And therefore, to take out a Spot of *Grease*, they vse a *Coele* vpon browne Paper; Because *Fire* worketh vpon *Grease*, or *Oyle*, as *Aire* doth vpon *Water*. And we see *Paper oyled*, or *Wood oyled*, or the like, last long moist: but *Wet* with *Water*, drie, or putrifie sooner. The Cause is, for that *Aire* meddeth little with the *Moisture* of *Oyle*.

Here is an Admirable demonstration, in the same trifling *Instance* of the little *Cloud* vpon *Glasse*, or *Gemmes*, or *Blades* of *Swords*, of the *Force* of *Vnion*, euen in the least *Quantities*, and weakest Bodies, how much it Conduceth to *Preseruatiō* of the present *Forme*; And the *Resisting* of a *New*. For marke well the discharge of that *Cloud*; And you shall see it euer breake vp, first in the *Skirts*, and last in the *middest*. We see likewise, that much *Water* draweth forth the *Iuyce* of the Body *Infused*; But little water, is imbibed by the Body: And this is a *Principall Cause*, why in *Operation* vpon Bodies, for their *Version* or *Alteration*, the *Triall* in great *Quantities*, doth not answer the *Triall* in small; And so deceiueth many; For that (I say) the greater Body, resisteth more any *Alteration* of *Forme*, and requireth far greater *Strength* in the *Actiue* Body, that should subdue it.

We haue spoken before in the fifth *Instance*, of the Cause of *Orient Colours*, in *Birds*; which is by the *Fineness* of the *Strainer*; we will now endeouour to reduce the same *Axiome* to a *Work*. For this *Writing* of our *Sylua Syluarum*, is (to speake properly) not *Naturall History*, but a high kinde of *Naturall Magicke*. For it is not a *Description* only of *Nature*, but a *Breaking* of *Nature*, into great and strange *Workes*. Tries therefore, the *Anointing* ouer of *Pigeons*, or other *Birds*, when they are but in their *downe*; Or of *Whelpes*, cutting their *Haire* as short as may be; Or of some other *Beast*; with some oyntment, that is not hurtfull to the *Flesh*; And that will harden, and sticke very close; And see whether it will not alter the *Colours* of the *Feathers*, or *Haire*. It is receiued, that the *Pulling* off, the first *Feathers* of *Birds*, cleane, will make the new come forth *White*: And it is certaine, that *White* is a penurious *Colour*, and where *Moisture* is scant. So *Blew Violets*, and other *Flowers*, if they be starued, turne *Pale* and *White*; *Birds*, and *Horses*, by *Age*, or *Scarres*, turne *White*: And the *Hoare Haires* of *Men*, come by the same reason. And therefore in *Birds*, it is very likely, that the *Feathers* that

Experiment  
Solitary tou-  
ching the Force  
of *Vnion*.

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Experiment  
Solitary tou-  
ching the Pro-  
ducing of Fea-  
thers and Haires  
of diuers Colours.

93



come first, will be many times of diuers Colours; according to the Nature of the *Bird*; For that the Skin is more porous; But when the Skin is more shut, and close, the Feathers will come *White*. This is a good *Experiment*, not only for the producing of *Birds*, and *Beasts* of strange Colours; but also for the Disclosure of the Nature of Colours themselves; which of them require a finer Porositie, and which a grosser.

Experiment  
Solitary touch-  
ing the Nour-  
ishment of Li-  
ving Creatures  
before they be  
brought forth.

94

**I**T is a worke of Prouidence, that hath beene truly obserued by some; That the *Yolke* of the *Egge*, conduceth little to the *Generation* of the *Bird*; But only to the *Nourishment* of the same: For if a *Chicken* be opened, when it is new hatched; you shall finde much of the *Yolke* remaining. And it is needfull, that *Birds*, that are shaped without the Females *Wombe*; haue in the *Egge*, as well Matter of Nourishment, as Matter of generation for the Body. For after the *Egge* is laid, and seuered from the Body of the *Hen*; It hath no more Nourishment from the *Hen*; But only a quickening *Heat* when shee sitteth. But *Beasts*, and *Men* need not the matter of Nourishment within themselves; Because they are shaped within the *Wombe* of the Female, and are nourished continually from her Body.

Experiments  
in Consort,  
touching Sym-  
patby and Anti-  
patby for Medi-  
cinall use.

95

**I**T is an Inueterate and receiued Opinion, that *Cantharides* applied to any part of the Body, touch the *Bladder*, and exulcerate it, if they stay on long. It is likewise Receiued, that a kinde of *Stone*, which they bring out of the *West Indies*, hath a peculiar force to moue *Grauell*, and to dissolue the *Stone*; In so much, as laid but to the wrest, it hath so forcibly sent downe *Grauell*, as *Men* haue beene glad to remoue it; It was so violent.

96

It is receiued and confirmed by daily Experience, that the *Soales* of the *Feet* haue great Affinitie with the *Head*, and the *Mouth* of the *Stomacke*: As we see, *Going wet-shod*, to those that vse it not, affecteth both: Applications of *hot Powders* to the *Feet* attenuate first, and after dry the *Rheume*: And therefore a *Physitian*, that would be Mystically, prescribeth, for the Cure of the *Rheume*, that a *Man* should walke Continually vpon a *Camomill Alley*; Meaning, that he should put *Camomill* within his *Sockes*. Likewise *Pigeons bleeding*, applyed to the *Soales* of the *Feet*, ease the *Head*: And *Soporiferous Medicines* applied vnto them, prouoke *Sleepe*.

97

It seemeth, that as the *Feet* haue a Sympathy with the *Head*; So the *Wrests* and *Hands*, haue a Sympathy with the *Heart*; We see the Affects and Passions of the *Heart*, and *Spirits*, are notably disclosed by the *Pulse*: And it is often tried, that Iuyces of *Stock-Gilly-Flowers*, *Rose-Campian*, *Garlicke*, and other things; applied to the *Wrests*, and renewed; haue cured long *Agues*. And I conceiue, that washing with certaine *Liquors*, the *Palmes* of the *Hands*, doth much good: And they doe well in *Heats* of *Agues*, to hold in the *Hands*, *Egges of Alabaster*, and *Balls of Crystall*.

Of these things we shall speake more, when we handle the Title of Sympathy and Antipathy, in the proper Place.

The



The Knowledge of man (hitherto) hath beene determined by the View, or Sight; So that whatsoever is Inuisible, either in respect of the *Finenesse of the Body* it selfe; Or the *Smalnesse of the Parts*; Or of the *Subtily of the Motion*; is little inquired. And yet these be the Things that Gouverne Nature principally; And without which, you cannot make any true *Analysis* and Indication of the Proceedings of Nature. The *Spirits* or *Pneumatics*, that are in all *Tangible Bodies*, are scarce knowne. Sometimes they take them for *Vacuum*; whereas they are the most Active of Bodies. Sometimes they take them for *Aire*; From which they differ exceedingly, as much as Wine from Water; And as Wood from Earth. Sometimes they will haue them to be *Naturall Heat*, or a *Portion of the Element of Fire*; Whereas some of them are crude and cold. And sometimes they will haue them to be the *Vertues* and *Qualities* of the *Tangible Parts*, which they see; whereas they are Things by themselves. And then, when they come to Plants and liuing Creatures, they call them *Soules*. And such Superficial Speculations they haue; Like Prospective, that shew things inward, when they are but Paintings. Neither is this a Question of Words, but infinitely materiall in Nature. For *Spirits* are nothing else but a *Naturall Body*, rarified to a Proportion, and included in the *Tangible Parts* of Bodies, as in an Integument. And they be no lesse differing one from the other, than the *Dense* or *Tangible Parts*: And they are in all *Tangible Bodies* whatsoever, more or lesse: And they are neuer (almost) at rest: And from them, and their *Motions*, principally proceed *Arefaction*, *Colliquation*, *Concoction*, *Maturation*, *Putrefaction*, *Vinification*, and most of the Effects of Nature: For, as we haue figured them in our *Sapientia Veterum*, in the Fable of *Proserpina*, you shall in the Infernall Regiment heare little Doings of *Pluto*, but most of *Proserpina*: For *Tangible Parts* in Bodies are Stupide things; And the *Spirits* doe (in effect) all. As for the differences of *Tangible Parts* in Bodies, the industry of the *Chymists* hath giuen some light, in discerning by their Separations, the *Oily*, *Crude*, *Pure*, *Impure*, *Fine*, *grosse Parts* of Bodies, and the like. And the *Physitians* are content to acknowledge, that *Herbs*, and *Drugs* haue diuers Parts; As that *Opium* hath a *Stupescative* Part, and a *Heating* Part; The one mouing Sleepe, the other a Sweat following; And that *Rubarb* hath *Purging* Parts, and *Astringent* Parts, &c. But this whole *Inquisition* is weakly and Negligently handled. And for the more subtil differences of the *Minute Parts*, and the Posture of them in the Body, (which also hath great Effects) they are not at all touched: As for the *Motions* of the *Minute Parts* of Bodies, which doe so great Effects, they haue not beene obserued at all, because they are Inuisible, and incur not to the Eye; but yet they are to be deprehended by Experience: As *Democritus* said well, when they charged him to hold, that the World was made of such little Moats, as were seene in the Sunne; *Atomus* (saith he) *necessitate Rationis & Experientia esse conuincitur; Atomum enim nemo unquam vidit*. And therefore the Tumult in the Parts of Solid Bodies, when they are compressed, which is the Cause of all



*Flight* of Bodies thorow the Aire, and of other *Mechanicall Motions*, (as hath beene partly touched before, and shall be thoroughly handled in due place) is not scene at all. But neuerthelesse, if you know it not, or enquire it not attentively and diligently, you shall neuer be able to discern, and much lesse to produce, a Number of *Mechanicall Motions*. Againe, as to the *Motions Corporall*, within the Enclosures of Bodies, whereby the Effects (which were mentioned before) passe between the *Spirits*, and the *Tangible Parts*; (which are, *Arefaction*, *Colligation*, *Concoction*, *Maturation*, &c.) they are not at all handled. But they are put off by the Names of *Vertues*, and *Natures*, and *Actions*, and *Passions*, and such other *Logicall Words*.

Experiment  
Solitary touching the  
Power of Heat.

99

**I**T is certaine, that of all *Powers* in *Nature*, *Heat* is the chiefe; both in the Frame of *Nature*, and in the works of *Art*. Certaine it is likewise, that the Effects of *Heat*, are most aduanced, when it worketh vpon a Body, without losse or dissipation of the Matter; for that euer betrayeth the Account. And therefore it is true, that the power of *Heat* is best perceiued in *Distillations*, which are performed in close Vessels, and Receptacles. But yet there is a higher Degree; For howsoever *Distillations* doe keepe the Body in Cels, and Cloisters, without Going abroad; yet they giue space vnto Bodies to turne into Vapour; To returne into Liquor; and to Separate one part from another. So as *Nature* doth Expariate, although it hath not full Liberty: whereby the true and Vltimate Operations of *Heat* are not attained. But if Bodies may be altered by *Heat*, and yet no such Reciprocation of *Rarefaction*, and of *Condensation*, and of *Separation*, admitted; then it is like that this *Proteus* of Matter, being held by the Sleeues, will turne and change into many *Metamorphoses*. Take therefore a *Square Vessell* of *Iron*, in forme of a Cube, and let it haue good thicke and strong Sides. Put into it a Cube of *Wood*, that may fill it as close as may be; And let it haue a Couer of *Iron*, as strong (at least) as the Sides; And let it be well Luted, after the manner of the *Chymists*. Then place the *Vessell* within burning *Coales*, kept quicke kindled, for some few houres space. Then take the *Vessell* from the *Fire*, and take off the Couer, and see what is become of the *Wood*. I conceiue that since all *Inflammation*, and *Evaporation* are vtterly prohibited, and the Body still turned vpon it selfe, that one of these two Effects will follow: Either that the Body of the *Wood* will be turned into a kinde of *Amalgama*, (as the *Chymists* call it;) Or that the Finer Part will be turned into *Aire*, and the Grosser sticke as it were baked, and incrustate vpon the Sides of the *Vessell*; being become of a Denser Matter, than the *Wood* it selfe, Crude. And for another Triall, take also *Water*, and put it in the like *Vessell*, stopped as before; But vse a gentler *Heat*, and remoue the *Vessell* sometimes from the *Fire*; And againe, after some small time, when it is Cold, renew the *Heating* of it: And repeat this *Alteration* some few times: And if you can once bring to passe, that the *Water*, which is one of the Simplest of Bodies, be changed in Colour, Odour, or Taste, after



after the manner of Compound Bodies, you may be sure that there is a great Worke wrought in Nature, and a Notable Entrance made into strange Changes of Bodies, and productions: And also a Way made, to doe that by Fire, in small time, which the Sunne and Age doe in long time. But of the Admirable Effects of this *Distillation in Close*, (for so we will call it) which is like the *Uombes* and *Matrices* of living creatures, where nothing Expireth, nor Separateth; We will speake fully, in the due place; Not that we Aime at the making of *Paracelsus Pigmey's*; Or any such Prodigious Follies; But that we know the Effects of *Heat* will be such, as will scarce fall vnder the Conceit of Man; If the force of it be altogether kept in.

**T** Here is nothing more Certain in Nature, than that it is impossible for any *Body*, to be vtterly *Annihilated*; But that, as it was the work of the Omnipotency of *God*, to make *Somewhat* of *Nothing*; So it requirereth the like Omnipotency, to turne *Somewhat* into *Nothing*. And therefore it is well said, by an Obscure Writer of the *Sect* of the *Chymists*; That there is no such way to effect the Strange *Transmutations* of *Bodies*, as to endeavour and vrge by all means, the *Reducing* of them to *Nothing*. And herein is contained also a great Secret of Preservation of Bodies from Change; For if you can prohibit, that they neither turne into *Aire*, because no *Aire* commeth to them; Nor goe into the *Bodies Adjacent*, because they are vtterly Heterogeneall; Nor make a *Round* and *Circulation* within themselves; they will neuer change, though they bee in their Nature neuer so Perishable, or Mutable. We see, how *Flies*, and *Spiders*, and the like, get a *Sepulcher* in *Amber*, more Durable, than the *Monument*, and *Embalming* of the *Body* of any *King*. And I conceiue the like will be of *Bodies* put into *Quick-silver*. But then they must be but thin; As a leafe, or a peece of Paper, or Parchment; For if they haue a greater Crassitude, they will alter in their owne *Body*, though they spend not. But of this, We shall speake more, when we handle the *Title of Conservation of Bodies*.

Experiment  
Solitary touching the  
Impossibility of An-  
nihilation.

100

D 2

NATV.



the Title of Consecration  
of Bodies.

We shall speak more, when we handle  
owns Body, though the y depend not. But of this

they have a greater Command, they will alter in their

but this; As a least, or a piece of Bread, or Wine; For it

it will be of Bodies, as into Earth, Air, But then they must be

Manner, and Endurance of the Body of any King. And I conceive the

Spiders, and the like, yet separated by Asides, more Durable, than the

their Natures are to Perish, or Moulder, Welter, how thin, and

how weak the creatures; they will not change, though they be in

because they are vitally Heterogeneous; Not made of Bread and Wine

because do not communicate in them; Yet still the Body is altered

is our Company; for if you can provide, that they be not mixed into what

And being is not essential, a great Secret of Preservation of Bodies

as to continuance of life, all means, the working of elements, Nature,

That is, as no Body can be so strong, as to resist the working of Elements;

For it is well said; by an Oracle, Victim of the Sea of the Chrymids;

with the like Omnipotency to turne Sea into Wine, And there

of the Omnipotent God to make Summer of Winter; So it is

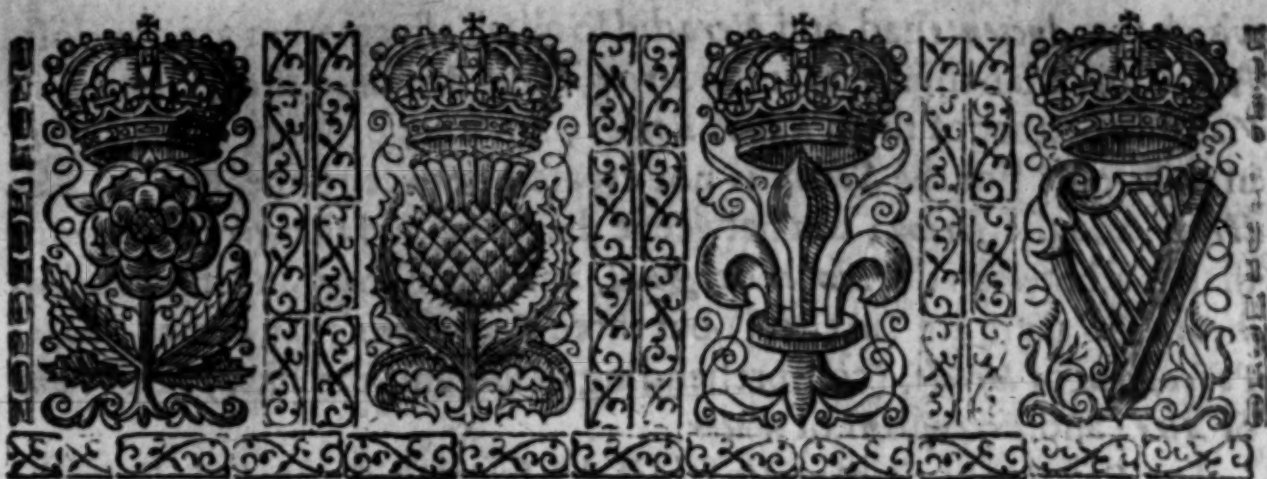
A. for any Body, to be vitally altered, But that as it was the work

T. There is nothing more Certain in Nature, than that it is impossible

100  
the Title of  
Consecration  
of Bodies.

be altogether kept in.  
be such as will render fallunder the Concept of Man; If the force of it  
any kind of religious Follies; But that we know the Effects of Water will  
the place; Not that we think of the making of Water as a Power of O  
where nothing is, nor is a Power; Yet will be a Power in the  
we will call it) which is like the Power and Nature of Long, or Short  
time. But of the Adorable Effects of the Omnipotent God, (as to  
to do what you will, in all time, while the Summer and Winter  
strange Changes of Rivers, and Productions; And the Water  
given by the Omnipotent Nature, and a Noble Spirit, has made it  
after the manner of Consecration, as may be seen in the





# NATVRALL HISTORIE.

## II. Century.

**M**VICK in the *Practice*, hath bin well pursued; And in good Variety; But in the *Theory*, and especially in the *Reelding* of the *Causes* of the *Practique*, very weakly; Being reduced into certaine *Mysticall Subtilties*, of no vse, and not much Truth. We shall therefore, after our manner, ioyne the *Contemplatiue* and *Actiue Part* together,

All Sounds, are either *Musicall Sounds*, which we call *Tones*; Whereunto there may be an *Harmony*; which Sounds are euer *Equall*; As *Singing*, the Sounds of *Stringed*, and *Wind-Instruments*, the *Ringings* of *Bels*, &c. Or *Immusicall Sounds*; which are euer *Vnequall*; Such as are the *Voice* in *Speaking*, all *Whisperings*, all *Voices* of *Beasts* and *Birds*, (except they be *Singing Birds*;) all *Percussions*, of *Stones*, *Wood*, *Parchments*, *Skins* (as in *Drummes*;) and infinite others.

The Sounds that produce *Tones*, are euer from such *Bodies*, as are in their *Parts* and *Pores* *Equall*; As well as the Sounds themselves are *Equall*; And such are the *Percussions* of *Metall*, as in *Bels*; Of *Glasse*, as in the *Filipping* of a *Drinking Glas*; Of *Aire*, as in *Mens voices* whilest they *Sing*, in *Pipes*, *Whistles*, *Organs*, *Stringed Instruments*, &c. And of *Water*; as in the *Nightingale-Pipes* of *Regalls*, or *Organs*, and other *Hydrallickes*; which

Experiments  
in Consort  
touching *Mu-  
sick*.

101

102



which the *Ancients* had, and *Ney* did so much esteeme, but are now lost. And if any Man thinke, that the *String* of the *Bow*, and the *String* of the *Viall*, are neither of them *Equall Bodies*; And yet produce *Tones*; he is in an errour. For the *Sound* is not created betweene the *Bow* or *Pletrum*, and the *String*; but betweene the *String* and the *Aire*; No more than it is between the *Finger* or *Quill*, and the *String*, in other *Instruments*. So there are (in effect) but three *Percussions* that create *Tones*; *Percussions* of *Metals*, (comprehending *Glasse*, and the like;) *Percussions* of *Aire*; and *Percussions* of *Water*.

103

The *Diapason* or *Eight* in *Musicke* is the sweetest *Concord*; Infomuch, as it is in effect an *Unison*; As we see in *Lutes*, that are strung in the *Base Strings* with two strings, one an *Eight* above another; Which make but as one *Sound*. And euery *Eighth Note* in Ascent (as from *Eight* to *Fifteene*: from *Fifteene* to *twenty two*, and so in infinitum,) are but *Scales of Diapason*. The *Cause* is darke, and hath not beene rendred by any; And therefore would be better contemplated. It seemeth that *Aire*, (which is the Subiect of *Sounds*) in *Sounds* that are not *Tones* (which are all *unequall*, as hath beene said) admitteth much *Variety*; As we see in the *Voices* of *Living Creatures*; And likewise in the *Voices* of seuerall *Men*; (for we are capable to discern seuerall *Men* by their *Voices*;) And in the *Coniugation of Letters*, whence *Articulate Sounds* proceed; Which of all others are most various. But in the *Sounds* which we call *Tones*, (that are euer *Equall*) the *Aire* is not able to cast it selfe into any such variety; But is forced to recurre into one and the same *Posture* or *Figure*, only differing in *Greatnesse* and *Smalnesse*. So we see *Figures* may be made of lines, *Crooked* and *Straight*, in infinite *Variety*, where there is *Inequality*; But *Circles*, or *Squares*, or *Triangles Equilaterall* (which are all *Figures*, of *Equall lines*) can differ but in *Greater*, or *Lesser*.

104

It is to be noted (the rather lest any Man should thinke, that there is any thing in this *Number of Eight*, to create the *Diapason*) that this *Computation of Eight*, is a thing rather receiued, than any true *Cōputation*. For a true *Computation* ought euer to be, by *Distribution* into *equall Portions*. Now there be interuenient in the *Rise of Eight* (in *Tones*) two *Beemolls*, or *Halfe-notes*; So as if you diuide the *Tones* equally, the *Eight* is but *seuen* whole and equal *Notes*; And if you subdiuide that into *Halfe Notes* (as it is in the *Stops of a Lute*) it maketh the *Number of thirteene*.

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Yet this is true; That in the ordinary *Rises* and *Falls* of the *Voice* of *Man* (not measuring the *Tone* by whole *Notes*, and halfe *Notes*, which is the *Equall Measure*;) there fall out to be two *Beemolls* (as hath beene said) betweene the *Unison* and the *Diapason*: And this *Varying* is naturall. For if a *Man* would endeouour to raise or fall his *Voice*, still by *Halfe-Notes*, like the *Stops of a Lute*; or by whole *Notes* alone, without *Halves*; as farre as an *Eight*, he will not be able to frame his *Voice* vnto it. Which sheweth, that after euery three whole *Notes* Nature requireth, for all *Harmonicall vse*, one *halfe Note* to be interposed.

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106

It is to be considered, that whatsoeuer *Vertue* is in *Numbers*, for  
Conducing



Conducing to Concent of *Notes*, is rather to be ascribed to the *Ante-Number*, than to the *Entire Number*; As namely, that the Sound returneth after *Six*, or after *Twelve*; So that the *Seuenth*, or the *Thirteenth*, is not the Matter, but the *Sixth*, or the *Twelfth*; And the *Seuenth* and the *Thirteenth* are but the limits and Boundaries of the *returne*.

The *Concords* in *Musicke* which are *Perfect*, or *Semiperfect*, betweene the *Unison*, and the *Diapason*, are the *Fifth*, which is the most *Perfect*; the *Third* next; And the *Sixth* which is more harsh: And as the Ancients esteemed, and so doe my selfe and some Other yet, the *Fourth* which they call *Diateffaron*. As for the *Tenth*, *Twelfth*, *Thirteenth*, and so *in infinitum*; they be but *Recurrances* of the Former; viz. of the *Third*, the *Fifth*, and the *Sixth*; being an *Eight* respectiue from them.

For *Discords*, the *Second*, and the *Seuenth*, are of all others the most odious, in *Harmony*, to the *Sense*; whereof the One is next about the *Unison*, the Other next vnder the *Diapason*: which may shew, that *Harmony* requireth a competent distance of *Notes*.

In *Harmony*, if there be not a *Discord* to the *Base*, it doth not disturbe the *Harmony*, though there be a *Discord* to the *Higher Parts*; So the *Discord* be not of the Two that are Odious; And therefore the ordinary *Concent* of *Four Parts* consisteth of an *Eight*, a *Fifth*, and a *Third* to the *Base*: But that *Fifth* is a *Fourth* to the *Treble*, and the *Third* is a *Sixth*. And the Cause is, for that the *Base* striking more Aire, doth overcome and drowne the *Treble*, (vnlesse the *Discord* be very Odious;) And so hideth a small Imperfection. For we see, that in one of the *lower Strings* of a *Lute*, there soundeth not the Sound of the *Treble*, nor any *Mixt Sound*, but only the Sound of the *Base*.

We haue no *Musicke* of *Quarter-Notes*; And it may be, they are not capable of *Harmony*; For we see the *Halfe-Notes* themselues doe but interpose sometimes. Neuerthelesse we haue some *Slides*, or *Relishes*, of the *Voyce*, or *Strings*, as it were continued without *Notes*, from one *Tone* to another, rising or falling, which are delightfull.

The Causes of that which is *Pleasing*, or *Ingrate* to the *Hearing*, may receiue light by that, which is *Pleasing* or *Ingrate* to the *Sight*. There be two Things *Pleasing* to the *Sight*, (leauing *Pictures*, and *Shapes* aside, which are but *Secondary Obiects*; And please or displease but in *Memory*;) these two are, *Colours*, and *Order*. The *Pleasing* of *Colour* symbolizeth with the *Pleasing* of any *Single Tone* to the *Eare*; But the *Pleasing* of *Order* doth symbolize with *Harmony*. And therefore we see in *Garden-knots*, and the *Frets of Houses*, and all equall and well-answering *Figures*, (as *Globes*, *Pyramides*, *Cones*, *Cylinders*, &c.) how they please; whereas *unequall Figures* are but *Deformities*. And both these *Pleasures*, that of the *Eye*, and that of the *Eare*, are but the Effects of *Equality*; *Good Proportion*, or *Correspondence*: So that (out of *Question*;) *Equality*, and *Correspondence*, are the Causes of *Harmony*. But to finde the *Proportion* of that *Correspondence*, is more abstruse; whereof notwithstanding we shall speake somewhat, (when we handle *Tones*;) in the generall Enquiry of *Sounds*.

Tones

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111



112

*Tones* are not so apt altogether to procure *Sleep*, as some other *Sounds*; As the *Wind*, the *Parling of Water*, *Humming of Bees*, a *Sweet Voice* of one that readeth, &c. The *Cause* whereof is, for that *Tones*, because they are Equall, and slide not, doe more strike and erect the *Sense*, than the other. And Over-much Attention hindereth *Sleepe*.

113

There be in *Musicke* certaine *Figures*, or *Tropes*; almost agreeing with the *Figures* of *Rhetoricke*; And with the *Affections* of the *Minde*, and other *Senses*. First, the *Diuision* and *Quauering*, which please so much in *Musicke*, haue an Agreement with the *Glittering of Light*; As the *Moone-Beames* playing vpon a *Waue*. Again, the *Falling* from a *Discord* to a *Concord*, which maketh great Sweetnesse in *Musick*, hath an Agreement with the *Affections*, which are reintegrated to the better, after some dislikes: It agreeth also with the *Taste*, which is soone glutted with that which is sweet alone. The *Sliding from the Close or Cadence*, hath an Agreement with the *Figure* in *Rhetoricke*, which they call *Prater Expectatum*; For there is a Pleasure euen in *Being deceived*. The *Reports*, and *Fuges*, haue an Agreement with the *Figures* in *Rhetoricke*, of *Repetition*, and *Traduction*. The *Tripla's*, and *Changing of Times*, haue an Agreement with the *Changes of Motions*; As when *Galliard Time*, and *Measure Time*, are in the *Medley* of one *Dance*.

114

It hath beene anciently held, and obserued, that the *Sense of Hearing*, and the *Kindes of Musicke*, haue most Operation vpon *Manners*; As to Incourage Men, and make them Warlike; To make them Soft and Effeminate; To make them Graue; To make them Light; To make them Gentle and inclined to Pitie, &c. The *Cause* is, for that the *Sense of Hearing* striketh the *Spirits* more immediatly, than the other *Senses*; And more incorporeally than the *Smelling*: For the *Sight*, *Taste*, and *Feeling*, haue their *Organs*, not of so present and immediate Access to the *Spirits*, as the *Hearing* hath. And as for the *Smelling*, (which indeed worketh also immediatly vpon the *Spirits*, and is forcible while the *Object* remaineth,) it is with a Communication of the *Breath*, or *Vapour* of the *Object* *Oderate*: But *Harmony* entering easily, and Mingling not at all, and Comming with a manifest Motion; doth by Custome of often Affecting the *Spirits*, and Putting them into one kinde of Posture, alter not a little the Nature of the *Spirits*, euen when the *Object* is remoued. And therefore we see, that *Tunes* and *Aires*, euen in their owne Nature, haue in themselves some Affinitie with the *Affections*; As there be *Merrie Tunes*, *Dolefull Tunes*, *Solemne Tunes*; *Tunes inclining Mens mindes to Pitie*; *Warlike Tunes*; &c. So as it is no Maruell, if they alter the *Spirits*; considering that *Tunes* haue a Predisposition to the *Motion* of the *Spirits* in themselves. But yet it hath beene noted, that though this varietie of *Tunes*, doth dispose the *Spirits* to variety of Passions, conforme vnto them; yet generally, *Musicke* feedeth that disposition of the *Spirits* which it findeth. We see also that seuerall *Aires*, and *Tunes*, doe please seuerall *Nations*, and *Persons*, according to the Sympathy they haue with their *Spirits*.



*Perspectiue* hath beene with some diligence inquired; And so hath the *Nature of Sounds*, in some sort, as farre as concerneth *Musicke*. But the *Nature of Sounds* in generall, hath beene superficially obserued. It is one of the subtillest Peeces of Nature. And besides, I practise, as I doe aduise; which is, after long Inquirie of Things, Immerle in Matter, to interpose some Subiect, which is Immaterialle, or lesse Materialle; Such as this of *Sounds*; To the end, that the *Intellect* may be Rectified, and become not Partiall.

It is first to be considered, what *Great Motions* there are in Nature, which passe without *Sound*, or *Noise*. The *Heauens* turne about, in a most rapide Motion, without *Noise* to vs perceiued; Though in some *Dreames* they haue beene said to make an excellent *Musicke*. So the *Motions* of the *Comets*, and *Fiery Meteors* (as *Stella Cadens*, &c.) yeeld no *Noise*. And if it be thought, that it is the Greatnesse of distance from vs, whereby the *Sound* cannot be heard; Wee see that *Lightnings*, and *Coruscations*, which are neere at hand, yeeld no *Sound* neither. And yet in all these, there is a Percussion and Diuision of the *Aire*. The *Winds* in the *Vpper Region* (which moue the *Clouds* aboue (which we call the *Racke*) and are not perceiued below) passe without *Noise*. The *lower Winds* in a *Plaine*, except they be strong, make no *Noise*; But amongst *Trees*, the *Noise* of such *Winds* will be perceiued. And the *Winds* (generally) when they make a *Noise*, doe euer make it vnequally, Rising and Falling, and sometimes (when they are vehement) Trembling at the Height of their Blast. *Raine*, or *Haile* falling, (though vehemently,) yeeldeth no *Noise*, in passing thorow the *Aire*, till it fall vpon the *Ground*, *Water*, *Houses*, or the like. *Water* in a *Riuer* (though a swift *Streame*) is not heard in the *Channell*, but runneth in Silence, if it be of any depth; But the very *Streame* vpon *Shallowes*, of *Grauell*, or *Pebble*, will be heard. And *Waters*, when they beat vpon the *Shore*, or are straitned, (as in the falls of *Bridges*;) Or are dashed against themselves by *Winds*, giue a *Roaring Noise*. Any peece of *Timber*, or *Hard Bodie*, being thrust forwards by another *Bodie* Contiguous, without knocking, giueth no *Noise*. And so *Bodies* in weighing, one vpon another, though the *upper Bodie* presse the *lower Bodie* downe, make no *Noise*. So the *Motion* in the *Minute Parts* of any *Solide Bodie*, (which is the Principall Cause of *Violent Motion*, though vnobserved;) passeth without *Sound*; For that *Sound*, that is heard sometimes, is produced onely by the Breaking of the *Aire*; And not by the Impulsion of the Parts. So it is manifest; That where the Anterior *Bodie* giueth way, as fast as the Posterior cometh on, it maketh no *Noise*; be the *Motion* neuer so great, or swift.

*Aire* open, and at large, maketh no *Noise*, except it be sharply percussed; As in the *Sound* of a *String*, where *Aire* is percussed by a hard, and

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and stiffe Body; And with a sharp loose; For if the String be not straitned, it maketh no Noise. But where the *Aire is pent*, and straitned, there Breath or other Blowing, (which carry but a gentle Percussion) suffice to create Sound; As in *Pipes*, and *Wind-Instruments*. But then you must note, that in *Recorders*, which goe with a gentle Breath, the *Concave* of the *Pipe*, were it not for the *Fipple*, that straitneth the *Aire* (much more than the *Simple Concave*;) would yeeld no Sound. For as for other *Wind-Instruments*, they require a forcible Breath; As *Trumpets*, *Cornets*, *Hunters hornes*, &c. Which appeareth by the blowne cheeks of him that windeth them. *Organs* also are blowne with a strong wind, by the *Bellows*. And note againe, that some kinde of *Wind-Instruments*, are blown at a small Hole in the side, which straitneth the Breath at the first Entrance; The rather, in respect of their *Traverse*, and *Stop* about the Hole, which performeth the *Fipples Part*; As it is seene in *Flutes*, and *Fifes*, which will not giue Sound, by a Blast at the end, as *Recorders*, &c. doe. Likewise in all *Whistling*, you contract the Mouth; And to make it more sharp; Men sometimes vse their Finger. But in *Open Aire*, if you throw a Stone, or a Dart, they giue no Sound: No more doe *Bullets*, except they happen to be a little hollowed in the Casting; Which *Hollownesse* penneth the *Aire*: Nor yet *Arrows*, except they be ruffled in their Feathers, which likewise penneth the *Aire*. As for *Small whistles*, or *Shepheards Oaten Pipes*; they giue a Sound, because of their extreme Slenderesse, whereby the *Aire* is more pent, than in a Wider *Pipe*. Again, the *Voices* of Men, and Liuing Creatures, passe thorow the throat, which penneth the Breath. As for the *Jewes Harpe*, it is a sharp Percussion; And besides, hath the vantage of penning the *Aire* in the Mouth.

117 Solide Bodies, if they be very softly percussed, giue no Sound; As when a man treadeth very softly vpon Boards. So Chests or Doores in faire weather, when they open easily, giue no Sound. And Cart-wheels squeak not, when they are liquored.

118 The Flame of Tapers, or Candles, though it be a swift Motion, and breaketh the *Aire*, yet passeth without Sound, *Aire in Ovens*, though (no doubt) it doth (as it were) boyle, and dilate it selfe, and is repercussed; yet it is without Noise.

119 Flame percussed by *Aire*, giueth a Noise; As in Blowing of the Fire by Bellows; Greater, than if the Bellows should blow vpon the *Aire* it selfe. And so likewise Flame percussing the *Aire strongly*, (as when Flame suddenly taketh, and openeth,) giueth a Noise; So, Great Flames, whiles the one impelleth the other, giue a bellowing Sound.

120 There is a Conceit runneth abroad, that there should be a *White Powder*, which will discharge a Peece without Noise; which is a dangerous Experiment, if it should be true: For it may cause secret Murthers. But it seemeth to me vnpossible; For, if the *Aire pent*, be driven forth, and striketh the *Aire open*, it will certainly make a Noise. As for the *White Powder* (if any such thing be, that may extinguish, or dead the Noise,) it



it is like to be a Mixture of *Petre*, and *Sulphur*, without *Coale*. For *Petre* alone will not take Fire. And if any man thinke, that the *Sound* may be extinguished, or deaded, by discharging the *Pent Aire*, before it cometh to the *Mouth* of the *Peece*, and to the *Open Aire*; That is not probable; For it will make more diuided *Sounds*: As if you should make a *Crosse Barrell* hollow, thorow the *Barrell* of a *Peece*, it may be, it would giue severall *Sounds*, both at the *Nose*, and at the *sides*. But I conceiue, that if it were possible, to bring to passe, that there should be no *Aire* pent at the *Mouth* of the *Peece*, the *Bullet* might fly with small, or no *Noise*. For first it is certaine, there is no *Noise* in the *Percussion* of the *Flame* vpon the *Bullet*. Next the *Bullet*, in piercing thorow the *Aire*, maketh no *Noise*; As hath beene said. And then, if there be no *Pent Aire*, that striketh vpon *Open Aire*, there is no Cause of *Noise*; And yet the *Flying* of the *Bullet* will not be stayed. For that *Motion* (as hath beene oft said) is in the *Parts* of the *Bullet*, and not in the *Aire*. So as triall must bee made by taking some small *Concaue* of *Metall*, no more than you meane to fill with *Powder*; And laying the *Bullet* in the *Mouth* of it, halfe out into the *Open Aire*.

I heard it affirmed by a Man, that was a great Dealer in Secrets, but he was but vaine; That there was a *Conspiracy* (which himselfe hindred,) to haue killed *Queene Mary*, Sister to *Queene Elizabeth*, by a *Burning-Glasse*, when shee walked in *Saint James Parke*, from the *Leads* of the *House*. But thus much (no doubt) is true; That if *Burning-Glasses* could be brought to a great strength, (as they talke generally of *Burning-Glasses*, that are able to burne a *Navy*;) the *Percussion* of the *Aire* alone, by such a *Burning-Glasse*, would make no *Noise*; No more than is found in *Coruscations*, and *Lightnings*, without *Thunders*.

I suppose, that *Impression* of the *Aire* with *Sounds*, asketh a time to be conueighed to the *Sense*; As well as the *Impression* of *Species visible*: Or else they will not be heard. And therefore, as the *Bullet* moueth so swift, that it is *Inuisible*; So the same *Swiftnesse* of *Motion* maketh it *Inaudible*: For wee see, that the *Apprehension* of the *Eye*, is quicker than that of the *Eare*.

All *Eruptions* of *Aire*, though small and slight, giue an *Entity* of *Sound*; which we call *Crackling*, *Puffing*, *Spitting*, &c. As in *Bay-salt*, and *Bay-leaves*, cast into the *Fire*; So in *Chestnuts*, when they leape forth of the *Ashes*; So in *Greene Wood* laid vpon the *Fire*, especially *Roots*; So in *Candles* that spit *Flame*, if they be wet; So in *Rasping*, *Sneezing*, &c. So in a *Rose-lease* gathered together into the fashion of a *Purse*, and broken vpon the *Fore-head*, or *Backe* of the *Hand*, as *Children* vse.

**T**He Cause giuen of *Sound*, that it should be an *Elision* of the *Aire* (wherby, if they mean any thing, they mean a *Cutting*, or *Diuiding*, or else an *Attenuating* of the *Aire*) is but a *Term* of *Ignorance*: And the *Motion* is but a *Catch* of the *Wir* vpon a few *Instances*; As the *Manner* is in the *Philosophy* Receiued. And it is common with *Men*, that if they haue

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have gotten a Pretty *Expression*, by a *Word* of *Art*, that *Expression* goeth curreant; though it be empty of *Matter*. This Conceit of *Elision*, appeareth most manifestly to be false, in that the *Sound* of a *Bell*, *String*, or the like, continueth melting, some time, after the *Percussion*; But ceaseth straight-ways, if the *Bell*, or *String*, be touched and stayed; whereas, if it were the *Elision* of the *Aire*, that made the *Sound*, it could not be, that the Touch of the *Bell*, or *String*, should extinguish so suddenly that Motion, caused by the *Elision* of the *Aire*. This appeareth yet more manifestly, by *Chiming* with a Hammer, vpon the Out-side of a *Bell*; For the *Sound* will be according to the inward Concaue of the *Bell*; whereas the *Elision*, or *Attenuation* of the *Aire*, cannot be but onely betweene the Hammer, and the Out-side of the *Bell*. So againe, if it were an *Elision*, a broad Hammer, and a *Bodkin*, stricke vpon Metall, would giue a diuers *Tone*; As well as a diuers *Loudnesse*: But they doe not so; For though the *Sound* of the one be *Louder*, and of the other *Softer*, yet the *Tone* is the same. Besides, in *Eccho's*, (whereof some are as loud as the *Originall Voice*,) there is no new *Elision*; but a *Repercussion* only. But that which conuinceth it most of all, is, that *Sounds* are generated, where there is no *Aire* at all. But these and the like Conceits, when Men haue cleared their vnderstanding, by the light of Experience, will scatter, and breake vp like a Mist.

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It is certaine, that *Sound* is not produced at the first, but with some *Locall Motion* of the *Aire*, or *Flame*, or some other *Medium*; Nor yet without some *Resistance*, either in the *Aire*, or the *Body Percussed*. For if there be a meere Yeelding, or Cession, it produceth no *Sound*; As hath beene said. And though *Sounds* differ from *Light*, and Colours; which passe thorow the *Aire*, or other *Bodies*, without any *Locall Motion* of the *Aire*; either at the first, or after. But you must attentiuely distinguish, betweene the *Locall Motion* of the *Aire*, (which is but *Vehiculum Causse*, A *Carrier of the Sounds*,) and the *Sounds* themselues, Conueighed in the *Aire*. For as to the former, we see manifestly, that no *Sound* is produced (no not by *Aire* it selfe against other *Aire*, as in *Organs*, &c.) but with a perceptible *Blast* of the *Aire*; And with some *Resistance* of the *Aire*, stricken. For euen all *Speech*, (which is one of the gentlest *Motions* of *Aire*,) is with expulsion of a little *Breath*. And all *Pipes* haue a *Blast*, as well as a *Sound*. We see also manifestly, that *Sounds* are carried with *Wind*: And therefore *Sounds* will be heard further with the *Wind*, than against the *Wind*; And likewise doe rise and fall with the Intension or Remission of the *Wind*. But for the *Impression* of the *Sound*, it is quite another Thing; And is vtterly without any *Locall Motion* of the *Aire*, Perceptible; And in that resembleth the *Species visible*: For after a *Man* hath lured, or a *Bell* is rung, we cannot discerne any *Perceptible Motion* (at all) in the *Aire*, a long as the *Sound* goeth; but only at the first. Neither doth the *Wind* (as far as it carrieth a *Voice*,) with the *Motion* thereof, confound any of the Delicate, and Articulate Figurations of the *Aire*, in Varietie of Words. And if a *Man* speake a good loudnesse, against the



the *Flame* of a *Candle*, it will not make it tremble much; though most, when those *Letters* are pronounced, which contract the Mouth; As *F*, *S*, *V*, and some others. But *Gentle Breathing*, or *Blowing* without *speaking*, will moue the *Candle* far more. And it is the more probable, that *Sound* is without any *Locall Motion* of the *Aire*, because as it differeth from the *Sight*, in that it needeth a *Locall Motion* of the *Aire* at first; So it paralleleth in so many other things with the *Sight*, and *Radiation of Things visible*; Which (without all question) induce no *Locall Motion* in the *Aire*, as hath beene said.

Neuerthelesse it is true, that vpon the *Noise* of *Thunder*, and great *Ordnance*; Glasse windowes will shake; and Fishes are thought to bee fraied with the Motion, caused by *Noise* vpon the water. But these Effects are from the *Locall Motion* of the *Aire*, which is a *Concomitant* of the *Sound* (as hath beene said;) and not from the *Sound*.

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It hath beene anciently reported, and is still receiued, that *Extreme Applauses*, and *Shouting of People* assembled in great Multitudes, haue so rarified, and broken the *Aire*, that *Birds* flying ouer, haue falne downe, the *Aire* being not able to support them. And it is beleeued by some, that *Great Ringing of Bels* in populous Cities, hath chased away *Thunder*: and also dissipated *Pestilent Aire*: All which may be also from the *Concussion* of the *Aire*, and not from the *Sound*.

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A very great *Sound*, neere hand, hath stricken many *Deafe*; And at the Instant they haue found, as it were, the breaking of a *Skin* or *Parchment* in their *Eare*: And my selfe standing neere on that *Lured* loud, and shrill, had suddenly an Offence, as if somewhat had broken, or beene dislocated in my *Eare*; And immediatly after, a *loud Ringing*; (Not an ordinary Singing, or Hissing, but far louder, and differing;) so as I feared some *Deafnesse*. But after some halfe Quarter of an Houre it vanished. This Effect may be truly referred vnto the *Sound*: For (as is commonly receiued) an *ouer-potent Obiect* doth destroy the *Sense*; And *spirituall Species*, (both *Visible* and *Audible*) will worke vpon the *Sensories*, though they moue not any other *Body*.

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In *Delation of Sounds*, the *Enclosure* of them preserueth them, and causeth them to be heard further. And wee finde in *Roules* of *Parchment*, or *Trunckes*, the Mouth being laid to the one end of the *Roule* of *Parchment*, or *Truncke*, and the *Eare* to the other, the *Sound* is heard much further, than in the *Open Aire*. The Cause is, for that the *Sound* spendeth, and is dissipated in the *Open Aire*; But in such *Concaues* it is conserued, and contracted. So also in a *Peece* of *Ordnance*, if you speak in the *Touch-hole*, and another lay his *Eare* to the Mouth of the *Peece*, the *Sound* passeth, and is farre better heard, than in the *Open Aire*.

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It is further to bee considered, how it proueth and worketh, when the *Sound* is not enclosed all the Length of his *VVay*, but passeth partly thorow open *Aire*; As where you *speake* some distance from a *Trunck*; or where the *Eare* is some distance from the *Trunck*, at the other End; Or where both *Mouth* and *Eare* are distant from the *Truncke*. And

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it is tried, that in a long *Trunke*, of some eight or ten foot, the *Sound* is holpen, though both the *Mouth*, and the *Eare* be a handfull, or more, from the Ends of the *Trunke*; And somewhat more holpen, when the *Eare* of the *Hearer* is neere, than when the *Mouth* of the *Speaker*. And it is certaine, that the *Voice* is better heard in a *Chamber* from *abroad*, than *abroad* from within the *Chamber*.

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As the *Enclosure*, that is *Round about and Entire*, preserueth the *Sound*; So doth a *Semi-Concaue*, though in a lesse degree. And therefore, if you diuide a *Trunke* or a *Cane* into two, and one speake at the one end, and you lay your *Eare* at the other, it will carry the *Voice* further, than in the *Aire* at large. Nay further, if it bee not a full *Semi-Concaue*; but if you doe the like vpon the *Mast* of a *Ship*, or a *long Pole*, or a *Peece of Ordnance* (though one speake vpon the Surface of the *Ordnance*, and not at any of the Bores;) the *Voice* will be heard further, than in the *Aire* at large.

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It would be tried, how, and with what proportion of disaduantage, the *Voice* will be carried in an *Horne*, which is a line Arched; Or in a *Trumpet*, which is a line Retorted; Or in some *Pipe* that were *Sinuous*.

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It is certaine, (howsoeuer it crosse the Receiued Opinion) that *Sounds* may be created without *Aire*, though *Aire* be the most fauourable *Deferent* of *Sounds*. Take a *Vessell* of *Water*, and knap a paire of *Tongs* some depth within the *Water*, and you shall heare the *Sound* of the *Tongs* well, and not much diminished; And yet there is no *Aire* at all present.

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Take one *Vessell* of *Siluer*, and another of *Wood*, and fill each of them full of *Water*, and then knap the *Tongs* together, as before, about an handfull from the *Bottom*, and you shall finde the *Sound* much more *Resounding* from the *Vessell* of *Siluer*, than from that of *Wood*: And yet if there be no water in the *Vessell*, so that you knap the *Tongs* in the *Aire*, you shall finde no difference, betweene the *Siluer* and *Woodden* *Vessell*. Whereby, beside the maine point of creating *Sound* without *Aire*, you may collect two Things: The one, that the *Sound* communicateth with the *Bottom* of the *Vessell*: The other, that such a *Communication* passeth farre better, thorow *Water*, than *Aire*.

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Strike any *Hard Bodies* together, in the *Middest* of a *Flame*, and you shall heare the *Sound*, with little difference, from the *Sound* in the *Aire*.

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The *Pneumaticall Part*, which is in all *Tangible Bodies*, and hath some *Affinity* with the *Aire*, performeth, in some degree, the *Parts* of the *Aire*; As when you knocke vpon an *Empty Barrell*, the *Sound* is (in part) created by the *Aire* on the *Out-side*; And (in part) by the *Aire* in the *Inside*; For the *Sound* will be greater or lesser, as the *Barrell* is more *Empty*, or more full; But yet the *Sound* participateth also with the *Spirit* in the *Wood*, thorow which it passeth, from the *Outside* to the *Inside*: And so it commeth to passe, in the *Chiming* of *Bels*, on the *Out-side*; where also the *Sound* passeth to the *Inside*: And a number of other



ther like Instances, whereof we shall speake more, when we handle the *Communication of Sounds*.

It were extreme Grossenesse to thinke (as we haue partly touched before) that the *Sound* in *Strings* is made, or produced, betweene the *Hand* and the *String*, or the *Quill* and the *String*, or the *Bow* and the *String*: For those are but *Vehicula Motus*, *Passages* to the *Creation* of the *Sound*; the *Sound* being produced betweene the *String* and the *Aire*; And that not by any *Impulsion* of the *Aire* from the first *Motion* of the *String*; but by the *Returne* or *Result* of the *String*, which was strained by the *Touch*, to his former Place: which *Motion* of *Result* is quicke and sharpe; Whereas the first *Motion*, is soft and dull. So the *Bow* tortureth the *String* continually, and thereby holdeth it in a *Continuall Trepidation*.

**T**ake a *Truncke*, and let one whistle at the one End, and hold your Eare at the other, and you shall finde the *Sound* strike so sharpe, as you can scarce endure it. The *Cause* is, for that *Sound* diffuseth it selfe in round; And so spendeth it selfe; But if the *Sound*, which would scatter in *Open Aire*, be made to goe all into a *Canale*; It must needs giue greater force to the *Sound*. And so you may note, that *Enclosures* doe not onely preserve *Sound*, but also Encrease and Sharpen it.

A *Hunters Horne*, being greater at one end, than at the other, doth increase the *Sound* more, than if the *Horne* were all of an equall Bore. The *Cause* is, for that the *Aire*, and *Sound*, being first contracted at the lesser End, and afterwards hauing more Roome to spread at the greater End; do dilate themselues; And in Comming out strike more *Aire*; whereby the *Sound* is the Greater, and Baser. And euen *Hunters Hornes*, which are sometimes made straight, and not Oblique, are euer greater at the lower end. It would be tried also in *Pipes*, being made far larger at the lower End: Or being made with a *Belly* towards the lower End; And then issui- g into a straight *Concaue* againe.

There is in *Saint James Fields*, a *Conduit* of *Bricke*, vnto which ioyneth a *low Vault*; And at the End of that, a *Round House* of *Stone*: And in the *Bricke Conduit* there is a *Window*; And in the *Round House* a *Slit* or *Rift* of some little breadth: If you cry out in the *Rift*, it will make a fearefull *Roaring* at the *Window*. The *Cause* is the same with the former; for that all *Concaues*, that proceed from more *Narrow* to more *Broad*, doe amplify the *Sound* at the *Comming out*.

*Hawkes Bells*, that haue *Holes* in the *Sides*, giue a greater *Ring*, than if the *Pellet* did strike vpon *Brasse*, in the *Open Aire*. The *Cause* is the same with the first *Instance* of the *Truncke*; Namely, for that the *Sound* Enclosed with the *Sides* of the *Bell*, commeth forth at the *Holes* vnspert, and more strong.

In *Drums*, the *Closenesse* round about, that preserveth the *Sound* from dispersing, maketh the *Noise* come forth at the *Drum-Hole*, farre more loud, and strong, than if you should strike vpon the like *Skin*, ex-

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tended in the Open Aire. The Cause is the same with the two precedent.

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Sounds are better heard, and further off, in an Evening, or in the Night, than at the Noone, or in the Day. The Cause is, for that in the Day, when the Aire is more Thin, (no doubt) the Sound pierceth better; But when the Aire is more Thicke (as in the Night) the Sound spendeth and spreadeth abroad lesse: And so it is a Degree of Enclosure. As for the Night, it is true also, that the Generall Silence helpeth.

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There be two Kinds of Reflexions of Sounds; The one at Distance, which is the Echo; Wherein the Originall is heard distinctly, and the Reflexion also distinctly; Of which we shall speake hereafter: The other in Concurrence; When the Sound Reflecting (the Reflexion being neere at hand) returneth immediatly vpon the Originall, and so iterateth it not, but amplifieth it. Therefore we see, that Musick vpon the water soundeth more; And so likewise Musick is better in Chambers Wainscotted, than Hanged.

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The Strings of a Lute, or Violl, or Virginals, doe giue a far greater Sound, by reason of the Knot, and Board, and Concaue vnderneath, than if there were nothing but onely the Flat of a Board, without that Hollow and Knot, to let in the Vpper Aire into the Lower. The Cause is, the Communication of the Vpper Aire with the Lower; And Penning of both from Expence, or Dispersing.

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An Irish Harpe hath Open Aire on both sides of the Strings: And it hath the Concaue or Belly, not along the Strings, but at the End of the Strings. It maketh a more Resounding Sound, than a Bandora, Orpharion, or Citterne, which haue likewise Wire-strings. I iudge the Cause to be, for that Open Aire on both Sides helpeth, so that there be a Concaue; Which is therefore best placed at the End.

147

In a Virginal, when the Lid is downe, it maketh a more exiile Sound, than when the Lid is open. The Cause is, for that all Shutting in of Aire, where there is no competent Vent, dampeth the Sound. Which maintaineth likewise the former Instance; For the Belly of the Lute, or Violl, doth pen the Aire somewhat.

148

There is a Church at Gloucester (and as I haue heard, the like is in some other places;) where if you speake against a Wall, softly, another shall heare your Voice better a good way off, than neere hand. Enquire more particularly of the Frame of that Place. I suppose there is some Vault, or Hollow, or Isle, behind the Wall, and some Passage to it towards the further end of that Wall, against which you speake; So as the Voice of him that speaketh, slideth along the Wall, and then entreth at some Passage, and communicateth with the Aire of the Hollow; For it is preserved somewhat by the plaine Wall; but that is too weake to giue a Sound Audible, till it hath communicated with the backe Aire.

149

Strike vpon a Bowstring, and lay the Horne of the Bow neere your Eare, and it will increase the Sound, and make a degree of a Tone. The Cause is, for that the Sensory, by reason of the Close Holding, is percussed,



cuffed, before the Aire disperseth. The like is, if you hold the *Horne* betwixt your Teeth. But that is a plaine *Delation* of the *Sound*; from the Teeth, to the Instrument of Hearing; For there is a great Entercourse betweene those two Parts; As appeareth by this; That a Harsh *Grating Tune* setteth the Teeth on edge. The like falleth out, if the *Horne* of the *Bow* be put vpon the Temples; But that is but the Slide of the *Sound* from thence to the Eare.

If you take a *Rod* of *Iron*, or *Brasse*, and hold the one end to your Eare, and strike vpon the other, it maketh a far greater *Sound*, than the like Stroke vpon the *Rod*, not so made Contiguous to the Eare. By which, and by some other *Instances*, that haue bene partly touched, it should appeare; That *Sounds* doe not only slide vpon the Surface of a Smooth Body, but doe also communicate with the Spirits, that are in the Pores of the Body.

I remember in *Trinity College* in *Cambridge*, there was an *Vpper Chamber*, which being thought weake in the Roofe of it, was supported by a Pillar of *Iron*, of the bignesse of ones Arme, in the midst of the *Chamber*; Which if you had stricke, it would make a little flat Noise in the *Roome* where it was stricke; But it would make a great Bombe in the *Chamber* beneath.

The *Sound* which is made by *Buckets* in a *Well*, when they touch vpon the *Water*; Or when they strike vpon the side of the *Well*; Or when two *Buckets* dash the one against the other; These *Sounds* are deeper, and fuller, than if the like Percussion were made in the *Open Aire*. The Cause is, the Penning and Enclosure of the Aire, in the Concaue of the *Well*.

*Barrels* placed in a *Roome* vnder the Floare of a *Chamber*, make all *Noises* in the same Chamber, more Full and Relounding.

So that there be five waies (in generall) of Maioration of Sounds: Enclosure Simple; Enclosure with Dilatation; Communication; Reflexion Concurrent; and Approach to the Sensory.

For *Exility* of the *Voice*, or other *Sounds*: It is certaine, that the *Voice* doth passe thorow *Solid* and *Hard Bodies*, if they be not too thick. And thorow *Water*; which is likewise a very Close Body, and such an one, as letteth not in Aire. But then the *Voice*, or other *Sound*, is reduced, by such passage, to a great *Weaknesse*, or *Exility*. If therefore you stop the *Holes* of a *Hawkes Bell*, it will make no Ring, but a flat Noise, or Rattle. And so doth the *Aëtites*, or *Eagles Stone*, which hath a little Stone within it.

And as for *Water*, it is a certaine Triall: Let a Man goe into a *Bath*, and take a *Paile*, and turne the Bottome vppward, and carry the Mouth of it, (Euen,) downe to the Leuell of the *Water*; and so presse it downe vnder the *Water*, some handfull and an halfe, still keeping it euen, that it may not tilt on either side, & so the Aire get out: Then let him that is in the *Bath*, diue with his Head so far vnder *Water*, as he may put his Head into the *Paile*; & there wil come as much *Aire* bubling forth, as wil make

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Roome for his Head. Then let him speak; and any that shall stand without, shall heare his *Voice* plainly; but yet made extreme sharp and exile, like the *Voice* of *Puppets*: But yet the *Articulate Sounds* of the *Words* will not be confounded. Note that it may be much more handsomly done, if the *Paile* be put ouer the Mans head aboue *Water*, and then he cower downe, and the *Paile* be pressed downe with him. Note that a man must kneele or sit, that he may be lower than the *Water*. A Man would think, that the *Sicilian Poet* had knowledge of this *Experiment*; For he saith; That *Hercules Page Hylas* went with a *Water-pot*, to fill it at a pleasant *Fountaine*, that was neere the Shore, and that the *Nymphs* of the *Fountaine* fell in loue with the Boy, and pulled him vnder *Water*, keeping him aliue; And that *Hercules* missing his *Page*, called him by his Name, aloud, that all the Shore rang of it; and that *Hylas* from within the *Water*, answered his Master; But (that which is to the present purpose) with so small and exile a *Voice*, as *Hercules* thought he had beene three miles off, when the *Fountaine* (indeed) was fast by.

156 In *Lutes*, and *Instruments of Strings*, if you stop a *String* high (whereby it hath lesse scope to tremble) the *Sound* is more *Treble*, but yet more dead.

157 Take two *Sawcers*, and strike the Edge of the one against the Bottom of the other, within a *Paile of Water*; And you shall finde, that as you put the *Sawcers* lower and lower, the *Sound* groweth more flat; euen while Part of the *Sawcer* is aboue the *Water*; But that Flatnesse of *Sound* is ioyned with a Harshnesse of *Sound*; which (no doubt) is caused by the Inequality of the *Sound*, which commeth from the part of the *Sawcer* vnder the *Water*, and from the Part aboue. But when the *Sawcer* is wholly vnder the *Water*, the *Sound* becommeth more cleare, but farre more low; And as if the *Sound* came from a farre off.

158 A *Soft Body* dampeth the *Sound*, much more than a *Hard*; As if a Bell hath Cloth, or Silke wrapped about it, it deadeth the *Sound* more, than if it were Wood. And therefore in *Clericals*, the *Keyes* are lined; And in *Colleges* they vse to line the *Tablemen*.

159 Triall was made in a *Recorder*, after these seuerall manners. The Bottom of it was set against the Palme of the Hand; stopped with Wax round about; set against a *Damaske Cushion*; Thrust into Sand; Into Ashes; Into *Water* (halfe an Inch vnder the *Water*;) Close to the Bottom of a *Siluer Basin*; And still the *Tone* remained: but the Bottom of it was set against a *Woollen Carpet*; A *Lining of Plush*; A *Lock of Wooll*, (though loosely put in;) Against *Snow*; And the *Sound* of it was quite deaded, and but *Breath*.

160 Iron Hot, produceth not so full a *Sound*, as when it is Cold; For while it is hot, it appeareth to be more Soft, and lesse Resounding. So likewise *Warme Water*, when it falleth, maketh not so full a *Sound*, as Cold: And I conceiue it is softer, and neerer the Nature of Oile; For it is more slippery; As may be perceiued, in that it scowreth better.

161 Let there be a *Recorder* made, with two *Fipples*, at each end one; The

Trunke



*Truncke* of it of the length of two *Recorders*, and the Holes answerable toward each end; And let two play the same Lesson vpon it, at an *Vnison*: And let it be noted, whether the *Sound* be confounded; or amplified; or dulled. So likewise let a *Crosse* bee made, of two *Trunckes* (thorow-out) hollow; And let two speake; or sing, the one long-waies, the other trauerse: And let two heare at the opposite Ends; And note, whether the *Sound* be confounded; amplified; or dulled. Which two *Instances* will also giue light to the *Mixture* of *Sounds*; whereof we shall speake hereafter.

A *Bellows* blowne in at the *Hole* of a *Drumme*, and the *Drumme* then stricken, maketh the *Sound* a little flatter, but no other apparent *Alteration*. The *Cause* is manifest; Partly for that it hindereth the *Issue* of the *Sound*; And partly for that it maketh the *Aire*, being blowne together, lesse moueable.

**T**He *Loudnesse* and *Softnesse* of *Sounds*, is a Thing distinct from the *Magnitude* and *Exility* of *Sounds*; For a *Base String*, though softly stricken, giueth the greater *Sound*; But a *Treble String*, if hard stricken, will be heard much further off. And the *Cause* is, for that the *Base String* striketh more *Aire*; And the *Treble* lesse *Aire*, but with a sharper *Percussion*.

It is therefore the *Strength* of the *Percussion*, that is a Principall *Cause* of the *Loudnesse* or *Softnesse* of *Sounds*: As in knocking harder or softer; Winding of a *Horne* stronger or weaker; Ringing of a *Hand-bell* harder or softer, &c. And the *Strength* of this *Percussion*, consisteth, as much, or more, in the *Hardnesse* of the *Body Percussed*, as in the *Force* of the *Body Percussing*: For if you strike against a *Cloth*, it will giue a lesse *Sound*; If against *Wood*, a greater; If against *Metall*, yet a greater; And in *Metalls*, if you strike against *Gold*, (which is the more pliant,) it giueth the flatter *Sound*; If against *Siluer*, or *Brasse*, the more Ringing *Sound*. As for *Aire*, where it is strongly pent, it matcheth a *Hard Body*. And therefore we see in discharging of a *Peece*, what a great *Noise* it maketh. We see also, that the *Charge* with *Bullet*; Or with *Paper* wet, and hard stopped; Or with *Powder* alone, rammed in hard; maketh no great difference in the *Loudnesse* of the *Report*.

The *Sharpnesse* or *Quicknesse* of the *Percussion*, is a great *Cause* of the *Loudnesse*, as well as the *Strength*: As in a *Whip*, or *Wand*, if you strike the *Aire* with it; the Sharper and Quicker you strike it, the Louder *Sound* it giueth. And in playing vpon the *Lute*, or *Virginalls*, the quicke *Stroke* or *Touch*, is a great life to the *Sound*. The *Cause* is, for that the Quicke *Striking* cutteth the *Aire* speedily; whereas the Soft *Striking* doth rather beat, than cut.

The *Communication* of *Sounds* (as in Bellies of *Lutes*, *Emp-tie Vessells*, &c.) hath beene touched obiter, in the *Maioration* of *Sounds*: But it is fit also to make a *Title* of it apart.

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Experiments in Consort, touching the Loudnesse or Softnesse of Sounds; and their Carriage at longer or shorter Distance.

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165

Experiments in Consort, touching the Communication of Sounds.

The



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The *Experiment* for greatest Demonstration of *Communication* of *Sounds*, is the *Chiming* of *Bells*; where if you strike with a Hammer vpon the Vpper Part, and then vpon the Midst, and then vpon the Lower, you shall finde the *Sound* to be more Treble, and more Base, according vnto the Concaue, on the Inside; though the percussio[n] be onely on the Out-side.

167

When the *Sound* is created betweene the *Blast* of the *Mouth*, and the *Aire* of the *Pipe*, it hath neuerthelesse some *Communication* with the Matter of the Sides of the *Pipe*, and the *Spirits* in them contained; for in a *Pipe* or *Trumpet*, of *Wood*, and *Brasse*, the *Sound* will be diuers; So if the *Pipe* be couered with *Cloth*, or *Silke*, it will giue a diuers *Sound*, from that it would doe of it selfe; So, if the *Pipe* be a little wet on the Inside, it will make a differing *Sound*, from the same *Pipe* drie.

168

That *Sound* made within *Water*, doth communicate better with a hard Body thorow *Water*, than made in *Aire*, it doth with *Aire*; Vide *Experimentum* 134.

Experiments  
in Confort tou-  
ching Equality,  
and Inequality  
of Sounds.

We haue spoken before ( in the *Inquisition* touching *Musicke*, ) of *Musicall Sounds*, whereunto there may be a Concord or Discord in two Parts; Which *Sounds* we call *Tones*: And likewise of *Immusicall Sounds*; And haue giuen the *Cause*, that the *Tone* proceedeth of *Equality*, and the other of *Inequality*. And we haue also exprest there, what are the *Equall Bodies* that giue *Tones*, and what are the *Vnequall* that giue none. But now we shall speake of such *Inequality* of *Sounds*, as proceedeth, not from the Nature of the Bodies themselues, but is Accidentall; Either from the *Roughnesse*, or *Obliquity* of the *Passage*; Or from the *Doubling* of the *Percutient*; Or from the *Trepidation* of the *Motion*.

169

A *Bell*, if it haue a *Rift* in it, whereby the *Sound* hath not a cleare *Passage*, giueth a *Hoarse* and *Iarring Sound*; So the *Voice* of *Man*, when by Cold taken the *Wefill* groweth rugged, and (as we call it) furred, becommeth hoarse. And in these two *Instances*, the *Sounds* are Ingrate; because they are meere *Vnequall*: But, if they be *Vnequall* in *Equalitie*, then the *Sound* is Gratefull, but Purling.

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All *Instruments*, that haue either *Returnes*, as *Trumpets*; Or *Flexions*, as *Cornets*; Or are *Drawne up*, and *put from*, as *Sackbuts*; haue a *Purling Sound*: But the *Recorder* or *Flute*, that haue none of these *Inequalities*, giue a cleare *Sound*. Neuerthelesse, the *Recorder* it selfe, or *Pipe* moistened a little in the Inside, soundeth more solemnly, and with a little Purling, or Hissing. Againe, a *Wreathed String*, such as are in the Base Strings of *Bandoraes*, giueth also a *Purling Sound*.

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But a *Lute-string*, if it be meere *Vnequall* in his Parts, giueth a Harsh and



and Vntuneable Sound; which *Strings* we call *False*, being bigger in one Place than in another; And therefore *Wire-strings* are neuer *False*. We see also, that when we trie a *False Lute-string*, we vse to extend it hard betweene the fingers, and to fillip it; And if it giueth a double *Species*, it is *True*; But if it giueth a treble, or more, it is *False*.

*Waters*, in the *Noise* they make as they runne, represent to the Eare a *Trembling Noise*; And in *Regalls*, (where they haue a *Pipe*, they call the *Nightingale-Pipe*, which containeth *Water*) the *Sound* hath a continuall *Trembling*: And Children haue also little Things they call *Cockes*, which haue *Water* in them; And when they blow, or whistle in them, they yeeld a *Trembling Noise*; Which *Trembling* of *Water*, hath an affinitie with the Letter *L*. All which *Inequalities* of *Trepidation*, are rather pleasant, than otherwise.

All *Base Notes*, or very *Treble Notes*, giue an *Asper Sound*; For that the *Base* striketh more *Aire*, than it can well strike equally: And the *Treble* cutteth the *Aire* so sharpe, as it returneth too swift, to make the *Sound* Equall: And therefore a *Meane* or *Tenor*, is the sweetest Part.

We know Nothing, that can at pleasure make a *Musical* or *Immusal* *Sound*, by voluntary *Motion*, but the *Voice* of *Man*, and *Birds*. The Cause is, (no doubt) in the *Weasill* or *Wind-pipe*, (which we call *Aspera Arteria*,) which being well extended, gathereth *Equality*; As a *Bladder* that is wrinckled; if it be extended, becommeth smooth. The Extension is alwayes more in *Tones*, than in *Speech*: Therefore the *Inward Voice* or *Whisper* can neuer giue a *Tone*: And in *Singing*, there is (manifestly) a greater Working and Labour of the Throat, than in *Speaking*; As appeareth in the Thrusting out, or Drawing in of the Chin, when we sing.

The *Humming* of *Bees*, is an *Vnequall Buzzing*; And is conceiued, by some of the Ancients, not to come forth at their Mouth, but to be an *Inward Sound*; But (it may be) it is neither; But from the motion of their Wings; For it is not heard but when they stirre.

All *Metalls quenched* in *Water*, giue a *Sibilation* or *Hissing Sound*; (which hath an Affinitie with the letter *Z*.) notwithstanding the *Sound* be created betweene the *Water* or *Vapour*, and the *Aire*. *Seething* also, if there be but small Store of *Water* in a Vessell, giueth a *Hissing Sound*; But *Boyling* in a full Vessell, giueth a *Bubling Sound*, drawing somewhat neare to the *Cockes* vsed by Children.

Triall would be made, whether the *Inequality*, or *Interchange* of the *Medium*, will not produce an *Inequality* of *Sound*; As if three *Bells* were made one within another, and *Aire* betwixt Each; and then the outermost *Bell* were chimed with a *Hammer*, how the *Sound* would differ from a *Simple Bell*. So likewise take a *Plate* of *Brasse*, and a *Plancke* of *Wood*, and ioyne them close together, and knock vpon one of them, and see if they doe not giue an *Vnequall Sound*. So make two or three *Partitions* of *Wood* in a *Hogshead*, with *Holes* or *Knots* in them; And marke the difference of their *Sound*, from the *Sound* of an *Hogshead*, without such *Partitions*.

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It



Experiments  
in Consort,  
touching the  
more Treble, and  
the more Base  
Tones, or Musi-  
call Sounds.

178

**I**T is eident, that the *Percussion* of the *Greater Quantity of Aire*, causeth the *Base Sound*; And the *lesse Quantity*, the more *Treble Sound*. The *Percussion* of the *Greater Quantity of Aire*, is produced by the *Greatnesse of the Body Percussing*; By the *Latitude* of the *Concaue*, by which the *Sound* passeth; and by the *Longitude* of the same *Concaue*. Therefore we see that a *Base string*, is greater than a *Treble*; A *Base Pipe* hath a greater Bore than a *Treble*; And in *Pipes*, and the like, the lower the *Note Holes* be, and the further off from the *Mouth* of the *Pipe*, the more *Base Sound* they yeeld; And the nearer the *Mouth*, the more *Treble*. Nay more, if you strike an *Entire Body*, as an *Andiron* of *Brasse*, at the *Top*, it maketh a more *Treble Sound*; And at the *Bottom* a *Base*.

179

It is also eident, that the *Sharper* or *Quicker Percussion of Aire* causeth the more *Treble Sound*; And the *Slower* or *Heavier*, the more *Base Sound*. So we see in *Strings*; the more they are wound vp, and strained; (And thereby giue a more quicke *Start-backe*;) the more *Treble* is the *Sound*; And the *flacker* they are, or *lesse* wound vp, the *Base* is the *Sound*. And therefore a *Bigger String* more strained, and a *Lesser String*, *lesse* strained, may fall into the same *Tone*.

180

*Children, Women, Eunuchs* haue more small and shrill *Voyces*, than *Men*. The Reason is, not for that *Men* haue greater Heat, which may make the *Voice* stronger, (for the strength of a *Voice* or *Sound*, doth make a difference in the *Loudnesse* or *Softnesse*, but not in the *Tone*;) But from the *Dilatation* of the *Organ*; which (it is true) is likewise caused by Heat. But the Cause of *Changing* the *Voice*, at the yeares of *Pubertie*, is more obscure. It seemeth to be, for that when much of the moisture of the *Body*, which did before irrigate the *Parts*, is drawne downe to the *Spermatieall vessells*; it leaueth the *Body* more hot than it was; whence commeth the *Dilatation* of the *Pipes*: For we see plainly, all Effects of Heat, doe then come on; As *Pilosity*, more *Roughnesse* of the *Skinne*, *Hardnesse* of the *Flesh*, &c.

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The *Industry* of the *Musitian*, hath produced two other Meanes of *Straining*, or *Intension* of *Strings*, besides their *Winding vp*. The one is the *Stopping* of the *String* with the *Finger*; As in the *Neckes* of *Lutes*, *Viols*, &c. The other is the *Shortnesse* of the *String*; As in *Harps*, *Virginalls*, &c. Both these haue one, and the same reason; For they cause the *String* to giue a quicke *Start*.

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In the *Straining* of a *String*, the further it is strained, the *lesse Superstraining* goeth to a *Note*; For it requireth good *Winding* of a *String*, before it will make any *Note* at all: And in the *Stops* of *Lutes*, &c. the higher they goe, the *lesse Distance* is betweene the *Frets*.

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If you fill a *Drinking-Glasse* with *Water*, (especially one *Sharpe* below, and *Wide* aboue,) and fillip vpon the *Brim*, or *Out-side*; And after emptie Part of the *Water*, and so more and more, and still trie the *Tone* by *Fillipping*; you shall finde the *Tone* fall, and be more *Base*, as the *Glasse* is more *Emptie*.

The



The Iust and Measured *Proportion* of the *Aire Percussed*, towards the *Basenesse* or *Treblenesse* of *Tones*, is one of the greatest Secrets in the Contemplation of *Sounds*. For it discovereth the true *Coincidence* of *Tones* into *Diapasons*; Which is the Returne of the same *Sound*. And so of the *Concords* and *Discords*, betweene the *Vnison*, and *Diapason*; Which we haue touched before, in the *Experiments* of *Musicke*; but thinke fit to resume it here, as a principall Part of our Enquiry touching the *Nature* of *Sounds*. It may be found out in the *Proportion* of the *Winding* of *Strings*: In the *Proportion* of the *Distance* of *Frets*; And in the *Proportion* of the *Concaue* of *Pipes*, &c. But most commodiously in the last of these.

Trie therefore the *Winding* of a *String* once about, as soone as it is brought to that Extension, as will giue a *Tone*; And then of twice about; And thrice about, &c. And marke the Scale or Difference of the Rise of the *Tone*: Whereby you shall discover, in one, two Effects; Both the *Proportion* of the *Sound* towards the *Dimension* of the *Winding*; And the *Proportion* likewise of the *Sound* towards the *String*, as it is more or lesse strained. But note that to measure this, the way will be, to take the Length in a right Line of the *String*, vpon any *Winding* about of the Pegge.

As for the *Stops*, you are to take the *Number* of *Frets*; And principally the *Length* of the *Line*, from the first *Stop* of the *String*, vnto such a *Stop* as shall produce a *Diapason* to the former *Stop*, vpon the same *String*.

But it will best (as it is said) appeare, in the *Bores* of *Wind-Instruments*: And therefore cause some halfe dozen *Pipes*, to be made, in length, and all things else, alike, with a single, double, and so on to a sextuple *Bore*; And so marke what Fall of *Tone* euery one giueth. But still in these three last *Instances*, you must diligently obserue, what *length* of *String*, or *Distance* of *Stop*, or *Concaue* of *Aire*, maketh what *Rise* of *Sound*. As in the last of these (which (as we said) is that, which giueth the aptest demonstration,) you must set downe what Encrease of *Concaue* goeth to the Making of a *Note* higher; And what of two *Notes*; And what of three *Notes*; And so vp to the *Diapason*: For then the great Secret of *Numbers*, and *Proportions*, will appeare. It is not vnlike, that those that make *Recorders*, &c. know this already: for that they make them in *Sets*. And likewise *Bell-founders* in fitting the Tune of their *Bells*. So that Enquiry may saue *Triall*. Surely, it hath beene obserued by one of the *Ancients*, that an *Emptie Barrell* knocked vpon with the finger, giueth a *Diapason* to the *Sound* of the like *Barrell full*; But how that should be, I doe not well vnderstand; For that the knocking of a *Barrell full*, or *Emptie*, doth scarce giue any *Tone*.

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Experiments  
in Consort,  
touching the  
*Proportion* of  
*Treble* and *Base*  
*Tones*.

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There is required some sensible Difference in the *Proportion* of creating a *Note*, towards the *Sound* it selfe, which is the *Passive*: And that it be not too neare, but at a distance. For in a *Recorder*, the three vppermost Holes, yeeld one *Tone*; which is a *Note* lower than the *Tone* of the first three. And the like (no doubt) is required in the Winding or Stopping of *Strings*.

Experiments  
in Consort  
touching *Exte-  
rior*, and *Inte-  
rior* Sounds.

There is another Difference of *Sounds*, which we will call *Exterior*, and *Interior*. It is not *Soft*, nor *Loud*: Nor it is not *Base*, nor *Treble*: Nor it is not *Musical*, nor *Immusical*: Though it be true, that there can be no *Tone* in an *Interior Sound*: But on the other side, in an *Exterior Sound*, there may be both *Musical* and *Immusical*. We shall therefore enumerate them, rather than precisely distinguish them; Though (to make some Adumbration of that we meane) the *Interior* is rather an *Impulsion* or *Contusion* of the *Aire*, than an *Elision* or *Section* of the same. So as the *Percussion* of the one, towards the other, differeth, as a *Blow* differeth from a *Cut*.

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In *Speech* of *Man*, the *Whispering*, (which they call *Susurrus* in *Latine*,) whether it be louder or softer, is an *Interior Sound*; But the *Speaking out*, is an *Exterior Sound*; And therefore you can neuer make a *Tone*, nor sing in *Whispering*; But in *Speech* you may: So *Breathing*, or *Blowing* by the *Mouth*, *Bellows*, or *Wind*, (though loud) is an *Interior Sound*; But the *Blowing* thorow a *Pipe*, or *Concane*, (though soft) is an *Exterior*. So likewise, the greatest *Winds*, if they haue no *Coarctation*, or blow not hollow, giue an *Interior Sound*; The *Whistling* or hollow *Wind* yeeldeth a *Singing*, or *Exterior Sound*; The former being pent by some other *Body*; The latter being pent in by his owne *Density*: And therefore we see, that when the *Wind* bloweth hollow, it is a *Signe* of *Raine*. The *Flame*, as it moueth within it selfe, or is blowne by a *Bellows*, giueth a *Murmur* or *Interior Sound*.

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There is no *Hard Body*, but stricke against another *Hard Body*, will yeeld an *Exterior Sound*, greater or lesser: In so much as if the *Percussion* be ouer-soft, it may induce a *Nullity* of *Sound*; But neuer an *Interior Sound*; As when one treadeth so softly, that he is not heard.

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Where the *Aire* is the *Percutient*, pent, or not pent, against a *Hard Body*, it neuer giueth an *Exterior Sound*; As if you blow strongly with a *Bellows* against a *Wall*.

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*Sounds* (both *Exterior* and *Interior*,) may be made, as well by *Suction*, as by *Emission* of the *Breath*: As in *Whistling*, or *Breathing*.

Experiments  
in Consort touch-  
ing *Articula-  
tion* of *Sounds*.

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It is euident, and it is one of the strangest *Secrets* in *Sounds*, that the *whole Sound* is not in the *whole Aire* only; But the *whole Sound* is also in euery small *Part* of the *Aire*. So that all the curious *Diuersity* of *Articulate*



ulate Sounds, of the Voice of Man, or Birds, will enter at a small Cranny, Inconfused.

The Unequall Agitation of the Winds, and the like, though they bee materiall to the Carriage of the Sounds, further, or lesse way; yet they doe not confound the Articulation of them at all, within that distance that they can be heard; Though it may be, they make them to be heard lesse Way, than in a Still; as hath beene partly touched.

Over-great Distance confoundeth the Articulation of Sounds; As wee see, that you may heare the Sound of a Preachers voice, or the like, when you cannot distinguish what he saith. And one Articulate Sound will confound another; As when many speake at once.

In the Experiment of Speaking under Water, when the Voice is reduced to such an Extreme Exility, yet the Articulate Sounds, (which are the Words,) are not confounded; as hath beene said.

I conceiue, that an Extreme Small, or an Extreme Great Sound, cannot be Articulate; But that the Articulation requireth a Mediocrity of Sound: For that the Extreme Small Sound confoundeth the Articulation by Contracting; And the Great Sound, by Dispersing: And although (as was formerly said) a Sound Articulate, already created, will be contracted into a small Cranny; yet the first Articulation requireth more Dimension.

It hath beene obserued, that in a Roome, or in a Chappell, Vaulted below, and Vaulted likewise in the Roofe, a Preacher cannot be heard so well, as in the like Places not so Vaulted. The Cause is, for that the Subsequent Words come on, before the Precedent words vanish: And therefore the Articulate Sounds are more confused, though the Grosse of the Sound be greater.

The Motions of the Tongue, Lips, Throat, Palat, &c. which goe to the Making of the severall Alphabetical Letters, are worthy Enquiry, and pertinent to the present Inquisition of Sounds: But because they are subtile, and long to describe, we will refer them over, and place them amongst the Experiments of Speech. The Hebrewes haue beene diligent in it, and haue assigned, which Letters are Liable, which Dentall, which Gutturall, &c. As for the Latines, and Grecians, they haue distinguished betweene Semi-vowels, and Mutes; And in Mutes, betweene Mutæ Tennes, Media, and Aspirata; Not amisse; But yet not diligently enough. For the speciall Strokes, and Motions, that create those Sounds, they haue little enquired: As that the Letters, B. P. F. M. are not expressed, but with the Contracting, or Shutting of the Mouth; That the Letters N. and B. cannot be pronounced, but that the Letter N. will turne into M. As Hecatomba, will be Hecatomba. That M. and T. cannot be pronounced together, but P. will come betweene; as Emptus, is pronounced Emptus; And a Number of the like. So that if you enquire to the full; you will finde, that to the Making of the whole Alphabet, there will be fewer Simple Motions required, than there are Letters.

The Lungs are the most Spongy Part of the Body; And therefore ablest to contract, and dilate it selfe: And where it contracteth it selfe,

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# NATVRALL HISTORIE.

## III. Century.



**A**LL Sounds (whatsoever) moue Round; That is to say; On all-Sides; Vpwards; Downwards; Forwards; and Backwards. This appeareth in all Instances.

Sounds doe not require to bee conueyed to the Sense, in a Right Line, as Visibles doe, but may be Archeth; Though it be true, they moue strongest in a Right Line; Which neuertheless is not caused by the Rightnesse of the Line, but by the Shortnesse of the distance; *Linea recta breuissima*. And therefore we see, if a Wall bee betweene, and you speake on the one Side, you heare it on the other; Which is not because the Sound passeth thorow the Wall; but Archeth ouer the Wall.

If the Sound be Stopped and Repercussed, it commeth about on the other Side, in an Oblique Line. So, if in a Coach, one side of the Boot be downe, and the other vp; And a Begger beg on the Close Side; you would thinke that he were on the Open Side. So likewise, if a Bell or Clocke, be (for Example) on the North-side of a Chamber; And the Window of that Chamber be vpon the South; He that is in the Chamber, will thinke the Sound came from the South.

Sounds though they spread round, (so that there is an Orbe or Sphericall Area of the Sound;) yet they moue strongest, and goe furthest in the Fore-lines, from the first Locall Impulsion of the Aire. And therefore in Preaching, you shall heare the Preachers Voice, better, before the Pulpit, than behinde it, or on the Sides, though it stand open. So a Hay-quebuz, or Ordnance, will be further heard, forwards, from the Mouth of the Peece, than backwards, or on the Sides.

It may bee doubted, that Sounds doe moue better Downwards than

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Experiments in Consort touching the Motions of Sounds, in what Lines they are Circular, Oblique, Straight; Vpwards, downwards; Forwards, Backwards.

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than Vpwards. *Pulpits* are placed high aboue the People. And when the Ancient *Generalls* spake to their Armies, they had euer a Mount of Turfe cast vp, whereupon they stood: But this may be imputed to the Stops and Obstacles, which the voice meeteth with, when one speaketh vpon the leuell. But there seemeth to be more in it: For it may bee, that *Spiritual Species*, both of *Things Visible* and *Sounds*, doe moue better *Downwards* than *Vpwards*. It is a strange Thing, that to Men standing below on the Ground, those that be on the Top of Pauls, seeme much lesse than they are, and cannot be knowne; But to Men aboue, those below seeme nothing so much lessened, and may bee knowne: yet it is true, that all things to them aboue, seeme also somewhat contracted, and better collected into Figure: as *Knots* in *Gardens* shew best from an Vpper-window, or Tarras.

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But to make an exact Triall of it, let a Man stand in a *Chamber*, not much aboue the Ground, and speake out at the window, through a *Trunke*, to one standing on the Ground, as softly as he can, the other laying his Eare close to the *Trunck*: Then *viâ versa*, let the other speake below keeping the same Proportion of Softnesse; And let him in the *Chamber* lay his Eare to the *Trunck*: And this may be the aptest Meanes, to make a Iudgement, whether *Sounds* descend, or ascend, better.

Experiments  
in Consort  
touching the  
Lasting & Per-  
sisting of Sounds;  
And touching  
the Time they  
require to their  
Generation, or  
Dilation.

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**A**FTER that *Sound* is created (which is in a moment) we finde it continueth some small time, melting by little and little. In this there is a wonderfull Errour amongst Men, who take this to be a *Continuance* of the First *Sound*; whereas (in truth) it is a *Renouation*, and not a *Continuance*: For the *Body percussed*, hath by reason of the *Percussion*, a *Trepidation* wrought in the *Minute Parts*; and so reneweth the *Percussion* of the *Aire*. This appeareth manifestly, because that the Melting *Sound* of a Bell, or of a String stricken, which is thought to be a *Continuance*, ceaseth as soone as the Bell or String are touched. As in a Virginal, as soone as euer the Iacke falleth; and toucheth the String, the *Sound* ceaseth; And in a Bell, after you haue chimed vpon it, if you touch the Bell, the *Sound* ceaseth. And in this you must distinguish, that there are two *Trepidations*: The one Manifest, and Locall; As of the Bell, when it is Penile: The other Secret, of the *Minute Parts*; such as is described in the ninth Instance. But it is true, that the *Locall* helpeth the *Secret* greatly. We see likewise that in Pipes, and other winde Instruments, the *Sound* lasteth no longer, than the breath bloweth. It is true, that in Organs, there is a confused Murmur for a while, after you haue plaied; But that is but while the Bellows are in Falling.

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It is certaine, that in the *Noise* of great *Ordinance*, where many are shot off together, the *Sound* will be carried, (at the least) twenty Miles vpon the land, and much further vpon the Water. But then it will come to the Eare; Not in the Instant of the Shooting off, but it will come an Houre, or more later. This must needs be a *Continuance* of the First *Sound*; For there is no *Trepidation* which should renew it. And the



the Touching of the *Ordinance* would not extinguish the *Sound* the sooner: So that in great *Sounds* the *Continuance* is more than *Momentary*.

To try exactly the time wherein *Sound* is *Delated*, Let a Man stand in a Steeple, and haue with him a Taper: And let some Vaile be put before the Taper: And let another Man stand in the Field a Mile off. Then let him in the Steeple strike the Bell: And in the same Instant withdraw the Vaile: And so let him in the Field tell by his Pulse what distance of *Time* there is, between the *Light* scene, and the *Sound* heard: For it is certaine that the *Delation* of *Light* is in an Instant. This may be tried in farre greater Distances, allowing greater *Lights* and *Sounds*.

It is generally knowne and obserued, that *Light*, and the *Object* of *Sight*, moue swifter than *Sound*: For we see the *Flash* of a *Peeces* scene sooner than the *Noise* is heard. And in *Hewing* wood, if one be some distance off, he shall see the *Arme* lifted vp for a second *Stroke*, before he heare the *Noise* of the first. And the greater the Distance, the greater is the *Preuention*: As we see in *Thunder* which is farre off, where the *Lightning* *Precedeth* the *Cracke* a good space.

*Colours*, when they represent themselves to the *Eye*, fade not, nor melt not by *Degrees*, but appeare still in the same *Strength*; But *Sounds* melt, and vanish, by little and little. The cause is, for that *Colours* participate nothing with the *Motion* of the *Aire*; but *Sounds* doe. And it is a plaine Argument, that *Sound* participateth of some *Locall Motion*, of the *Aire* (as a Cause *Stimulus* non.) in that, it perisheth so suddenly; For in euery *Section*, or *Impulsion* of the *Aire*, the *Aire* doth suddenly restore and reunite it selfe; which the *Water* also doth, but nothing so swiftly.

In the *Trialls* of the *Passage*, or *Not Passage* of *Sounds*, you must take heed, you mistake not the *Passing By the Sides* of a *Body*, for the *Passing thorow* a *Body*: And therefore you must make the *Intercepting Body* very close; For *Sound* will passe thorow a small *Chincke*.

Where *Sound* passeth thorow a *Hard*, or *Close Body* (as thorow *Water*; thorow a *Wall*; thorow *Masonry*; as in *Hawkes Bells* stopped, &c.) the *Hard*, or *Close Body*, must be but thin and small; For else it deadeth and extinguisheth the *Sound* vterly. And therefore, in the *Experiments* of *Speaking in Aire vnder Water*, the *Voice* must not be very deep within the *Water*: For then the *Sound* pierceth not. So if you speake on the further side of a *Close Wall*, if the *Wall* be very thicke, you shall not be heard: And if there were an *Hoghead* empty, whereof the *Sides* were some two Foot thicke, and the bung hole stopped, I conceiue the *Resounding Sound*, by the *Communication* of the *Outward Aire*, with the *Aire within*, would be little or none: But only you shall heare the *Noise* of the *Outward Knocke*, as if the *Vessell* were full.

Experiments  
in Consort,  
touching the  
Passage and In-  
terceptions of  
Sounds

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It is certaine, that in the *Passage of Sounds*, thorow *Hard Bodies*, the Spirit or Pneumaticall Part of the *Hard body* it selfe, doth cooperate; But much better, when the *Sides* of that *Hard Body* are stricke, than when the *Percussion* is onely within, without *Touch* of the *Sides*. Take therefore a *Hawkes Bell*, the holes stooped up, and hang it by a threed, within a *Bottle Glasse*; And stop the *Mouth* of the *Glasse*, very close with *Wax*; And then shake the *Glasse*, and see whether the *Bell* giue any *Sound* at all, or how weake? But note, that you must in stead of the *Threed* take a *Wire*; Or else let the *Glasse* haue a great *Belly*; lest when you shake the *Bell*, it dash vpon the *Sides* of the *Glasse*.

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It is plaine, that a *very Long*, and *Down-right Arch*, for the *Sound* to passe, will extinguish the *Sound* quite; So that that *Sound*, which would be heard ouer a *Wall*, will not be heard ouer a *Church*; Nor that *Sound*, which will be heard, if you stand some distance from the *Wall*, will be heard if you stand close vnder the *Wall*.

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*Soft* and *Forcible* Bodies, in the first *Creation* of the *Sound*, will dead it; For the *Striking* against *Cloth*, or *Fur*, will make little *Sound*; As hath beene said: But in the *Passage* of the *Sound*, they will admit it better than *Harder Bodies*; As we see, that *Curtaines*, and *Hangings*, will not stay the *Sound* much; But *Glasse*-windowes, if they be very close, will checke a *Sound* more, than the like *Thicknesse* of *Cloth*. Wee see also, in the *Rumbling* of the *Belly*, how easily the *Sound* passeth thorow the *Guts*, and *Skin*.

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It is worthy the *Inquiry*, whether *Great Sounds* (As of *Ordnance*, or *Bells*) become not more *Weak*, and *Exile*, when they passe thorow *Small Crannies*. For the *Subtilties* of *Articulate Sounds* (it may be) may passe thorow *Small Crannies*, not confused; But the *Magnitude* of the *Sound* (perhaps) not so well.

Experiments  
in Consonance  
touching the  
Medium of  
Sounds.

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The *Mediums* of *Sounds* are *Aire*; *Soft* and *Porous Bodies*; Also *Water*. And *Hard Bodies* refuse not altogether to bee *Mediums* of *Sounds*. But all of them are dull and vnapt *Deferents*, except the *Aire*.

In *Aire*, the *Thinner* or *Drier Aire*, carrieth not the *Sound* so well, as the more *Dense*; As appeareth in *Night Sounds*; And *Evening Sounds*; And *Sounds* in moist *Weather*, and *Southerne Winds*. The reason is already mentioned in the *Tale* of *Mutation* of *Sounds*; Being for that *Thinner Aire* is better pierced; but *Thick Aire* preserveth the *Sound* better from *Wast*; Let further *Triall* be made by *Hollowing* in *Mists*, and *Gentle Showers*; For (it may be) that will somewhat dead the *Sound*.

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How farre forth *Flame* may be a *Medium* of *Sounds* (especially of such *Sounds* as are created by *Aire*, and not betwixt *Hard Bodies*) let it bee tried, in *Speaking* where a *Bonfire* is betwixt; But then you must allow, for some disturbance, the *Noise* that the *Flame* it selfe maketh.

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Whether any other *Light*, being made a *Medium*, cause a *Diversity* of *Sound* from *Water*, it may be tried: As by the *Knapping* of the *Tongs*; Or *Striking* of the *Bottom* of a *Vessell*, filled either with *Milk*,

or



or with Oyle; which though they be more light, yet are they more vn-equall Bodies than Aire.

Of the Natures of the Mediums, we haue now spoken; As for the Disposition of the said Mediums, it doth consist in the Penning, or not Penning of the Aire; Of which wee haue spoken before, in the Title of Delation of Sounds: It consisteth also in the Figure of the Concaue, thorow which it passeth; Of which we will speake next.

How the Figures of Pipes, or Concaues, thorow which Sounds passe; Or of other Bodies deferent; conduce to the Varietie and Alteration of the Sounds; Either in respect of the Greater Quantitie, or lesse Quantitie of Aire, which the Concaues receiue; Or in respect of the Carrying of Sounds longer or shorter way; Or in respect of many other Circumstances; they haue beene touched, as falling into other Titles. But those Figures, which we now are to speake of, we intend to be, as they concerne the Lines, thorow which Sound passeth; As Straight; Crooked; Angular; Circular; &c.

The Figure of a Bell partaketh of the Pyramis, but yet comming off, and dilating more suddenly. The Figure of a Hunters Horne, and Cornet, is oblique; yet they haue likewise Straight Hornes; which if they be of the same Bore with the Oblique, differ little in Sound; Saue that the Straight require somewhat a stronger Blast. The Figures of Recorders, and Flutes, and Pipes are straight; But the Recorder hath a lesse Bore, and a greater; Aboue, and below. The Trumpet hath the Figure of the Letter S; which maketh that Purling Sound, &c. Generally, the Straight Line hath the cleaneft and roundest Sound, and the Crooked the more Hoarse, and Iarring.

Of a Sinuous Pipe, that may haue some foure Flexions, Triall would be made. Likewise of a Pipe, made like a Crosse, open in the middest. And so likewise of an Angular Pipe; And see what will be the Effects of these seuerall Sounds. And so againe of a Circular Pipe; As if you take a Pipe perfect Round, and make a Hole whereinto you shall blow; And another Hole not farre from that; But with a Trauerse or Stop between them; So that your breath may goe the Round of the Circle, and come forth at the second Hole. You may trie likewise Percussions of Solide Bodies of seuerall Figures; As Globes, Flats, Cubes, Crosse, Triangles, &c. And their Combinations; As Flat against Flat; And Connex against Connex; And Connex against Flat, &c. And marke well the diuersities of the Sounds. Trie also the difference in Sound of seuerall Craftsmen of Hard Bodies percussed; And take knowledge of the diuersities of the Sounds. I my selfe haue tried, that a Bell of Gold yeeldeth an excellent Sound, not inferiour to that of Silver, or Brasse, but rather better: yet we see that a

Experiments  
in Consort,  
what the Fi-  
gures of the  
Pipes, or Con-  
caues, or the  
Bodies Deferent  
conduce to the  
Sounds.

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peece of Money of Gold soundeth farre more flat than a peece of Money of Silver.

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The Harpe hath the *Concase*, not along the *Strings*, but acrossse the *Strings*; And no *Instrument* hath the *Sound* so Melting, and Prolonged, as the *Irisb Harpe*. So as I suppose, that if a *Virginal* were made with a double *Concase*; the one all the length as the *Virginal* hath; the other at the End of the *Strings*, as the *Harpe* hath; It must needs make the *Sound* perfecter, and not so Shallow, and Iarring. You may trie it, without any *Sound-Board* along, but only Harpe-wile, at one end of the *Strings*: Or lastly with a double *Concase*, at Each end of the *Strings* one.

Experiments  
in Consorty  
touching the  
Mixture of  
Sound.

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Here is an apparent Diverfitie between the *Species Visible*, and *Audible*, in this; That the *Visible* doth not mingle in the *Medium*, but the *Audible* doth. For if we looke abroad, we see Heauen, a number of Starres, Trees, Hills, Men, Beasts, at once. And the *Species* of the one doth not confound the other. But if so many sounds came from severall Parts, one of them would vterly confound the other. So we see, that *Voices* or *Consorts* of *Musicke* doe make an Harmony by *Mixture*, which *Colours* doe not. It is true neuerthelesse, that a great *Light* drowneth a smaller, that it cannot be seene; As the *Sunne* that of a *Gloworme*; as well as a Great *Sound* drowneth a lesser. And I suppose likewise, that if there were two *Lanthornes* of Glasse, the one a *Crimsin*, and the other an *Azure*, and a *Candle* within either of them, those *Coloured Lights* would mingle, and cast vpon a *White Paper* a *Purple Colour*. And even in *Colours*, they yeeld a faint and weake *Mixture*: For white walls make *Roomes* more lightsome than blacke, &c. But the Cause of the *Confusion* in *Sounds*, and the *Inconfusion* in *Species Visible*, is, For that the *Sight* worketh in *Right Lines*, and maketh severall *Cones*; And so there can be no *Coincidence* in the *Eye*, or *Visuall Point*: But *Sounds*, that moue in *Oblique* and *Arcuate Lines*, must needs encounter, and disturbe the one the other.

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The sweetest and best *Harmony* is, when euery *Part*, or *Instrument*, is not heard by it selfe, but a *Conflation* of them all; Which requireth to stand some distance off. Even as it is in the *Mixture* of *Perfumes*; Or the *Taking* of the *Smells* of severall *Flowers* in the *Aire*.

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The *Disposition* of the *Aire*, in other *Qualities*, except it be ioyned with *Sound*, hath no great *Operation* vpon *Sounds*: For whether the *Aire* be lightsome or darke, hot or cold, quiet or stirring, (except it be with *Noise*) sweet-smelling, or stinking, or the like; it importeth not much: Some petty *Alteration* or *disfarrance* it may make.

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But *Sounds* doe disturbe and alter the one the other: Sometimes the one drowning the other, and making it not heard; Sometimes the one Iarring, and discording with the other, and making a *Confusion*; Sometimes the one Mingling and *Compounding* with the other, and making an *Harmony*.

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Two *Voices* of like *tendresse*, will not be heard, twice as farre, as one of



of them alone; And two *Candles* of like light, will not make Things seene twice as farre off, as one. The Cause is profound; But it seemeth that the *Impressions* from the *Objects* of the *Senses*, doe *mingle* respectively, euery one with his kinde; But not in proportion, as is before demonstrated: And the reason may be, because the first *Impression*, which is from *Prinative* to *Active*, (As from *Silence* to *Noise*, or from *Darknesse* to *Light*,) is a greater Degree, than from *Lesse Noise*, to *More Noise*, or from *Lesse Light*, to *More Light*. And the Reason of that againe may be; For that the *Aire*, after it hath receiued a Charge, doth not receiue a Surcharge, or greater Charge, with like Appetite, as it doth the first Charge. As for the Encrease of Vertue, generally, what Proportion it beareth to the Encrease of the Matter, it is a large Field, and to be handled by it selfe.

**A**LL *Reflexions Concurrent* doe make *Sounds* Greater; But if the Body that createth, either, the Originall *Sound*, or the *Reflexion*, be cleane and smooth, it maketh them Sweeter. Triall may be made of a *Lute*, or *Violl*, with be Belly of polished Brasse, in stead of Wood. We see that euen in the open *Aire*, the *Wire String* is sweeter, than the *String* of *Guts*. And we see that for *Reflexion*, *Water* excelleth; As in *Musicke* neare the *Water*; Or in *Eccho's*.

It hath beene tried, that a *Pipe* a little moistned on the inside, but yet so as there be no Drops left, maketh a more solemne *Sound*, than if the *Pipe* were drie: But yet with a sweet degree of *Sibillation*, or *Purling*; As we touched it before in the title of *Equalitie*. The Cause is, for that all Things Porous, being superficially wet, and (as it were) betweene drie and wet, become a little more Euen and Smooth; But the *Purling*, (which must needs proceed of *Inequalitie*,) I take to be bred betweene the Smoothnesse of the inward Surface of the *Pipe*, which is wet; And the Rest of the Wood of the *Pipe*, vnto which the Wet commeth not, but it remaineth drie.

In *Frostie weather*, *Musicke* within doores soundeth better. Which may be, by reason, not of the Disposition of the *Aire*, but of the *Wood* or *String* of the *Instrument*, which is made more Crispe, and so more porous and hollow: And wee see that *Old Lutes* sound better than *New*, for the same reason. And so doe *Lute-strings* that haue beene kept long.

*Sound* is likewise *Meliorated* by the *Mingling* of open *Aire* with *Pent Aire*; Therefore Triall may be made, of a *Lute* or *Violl* with a double Belly; Making another Belly with a Knot ouer the Strings; yet so, as there be Roome enough for the Strings, and Roome enough to play below that Belly. Triall may be made also of an *Irish Harpe*, with a *Concau* on both Sides; Whereas it vseth to haue it but on one Side. The doubt may be, lest it should make too much Resounding; whereby one Note would ouertake another.

If you sing into the Hole of a *Drumme*, it maketh the *Singing* more sweet.

Experiments  
in Consort tou-  
ching *Meliora-  
tion* of *Sounds*.

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sweet. And so I conceive it would, if it were a *Song* in Parts, sung into severall *Drums*; And for handsomnesse and strangeness sake, it would not be amisse to have a Curtaine betweene the Place where the *Drums* are, and the *Hearers*.

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When a *Sound* is created in a *Wind-Instrument*, betweene the *Breath* and the *Aire*, yet if the *Sound* be communicate with a more equall Bodie of the *Pipe*, it *meliorateth* the *Sound*. For (no doubt) there would be a differing *Sound* in a *Trumpet*, or *Pipe of Wood*; And againe in a *Trumpet* or *Pipe of Brasse*. It were good to trie *Recorders* and *Hunters Hornes* of *Brasse*, what the *Sound* would be.

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*Sounds* are *meliorated* by the *Intension* of the *Sense*; where the *Common Sense* is collected most, to the *particular Sense* of *Hearing*, and the *Sight* suspended: And therefore, *Sounds* are sweeter, (as well as greater,) in the *Night*, than in the *Day*; And I suppose, they are sweeter to blinde Men; than to Others: And it is manifest, that betweene *Sleeping* and *Waking*, (when all the *Senses* are bound and suspended) *Musicke* is farre sweeter, than when one is *fully Waking*.

Experiments  
in Confort touch-  
ing the Imita-  
tion of Sounds

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IT is a Thing strange in Nature, when it is attentively considered; How *Children*, and some *Birds*, learne to *imitate Speech*. They take no Marke (at all) of the *Motion* of the *Mouth* of Him that speaketh; For *Birds* are as well taught in the Darke, as by Light. The *Sounds* of *Speech* are very Curious and Exquisite: So one would thinke it were a Lesson hard to learne. It is true, that it is done with time, and by little and little, and with many *Essayes* and *Proffers*: But all this dischargeth not the Wonder. It would make a Man thinke (though this which we shall say may seeme exceeding strange) that there is some *Transmission* of *Spirits*; and that the *Spirits* of the *Teacher* put in Motion, should worke with the *Spirits* of the *Learner*, a Pre-disposition to offer to *Imitate*; And so to perfect the *Imitation* by degrees. But touching *Operations* by *Transmissions* of *Spirits*, (which is one of the highest Secrets in Nature,) we shall speake in due place; Chiefly when wee come to enquire of *Imagination*. But as for *Imitation*, it is certaine, that there is in Men, and other Creatures, a predisposition to *Imitate*. Wee see how readie Apes and Monkeys are, to *imitate* all *Motions* of Man: And in the Catching of Dottrells, we see, how the Foolish Bird playeth the Ape in Gestures: And no Man (in effect) doth accompany with others, but hee learneth, (ere he is aware,) some *Gesture*, or *Voice*, or *Fashion* of the other.

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In *Imitation* of *Sounds*, that Man should be the *Teacher*, is no Part of the Matter; For *Birds* will learne one of another; And there is no Reward, by feeding, or the like, giuen them for the *Imitation*; And besides, you shall haue Parrots, that will not only *imitate Voyces*, but Laughing, Knocking, Squeaking of a Doore vpon the Hinges, or of a Cart-wheele; And (in effect) any other *Noise* they heare.

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No *Beast* can *imitate* the *Speech* of Man, but *Birds* onely; For the Ape

it



it selfe, that is so ready to *imitate* otherwise, attaineth not any degree of *Imitation* of Speech. It is true, that I have knowne a Dog, that if one howled in his Eare, he would fall a howling a great while: What should be the Aptnesse of *Birds*, in comparison of *Beasts*, to *imitate* the Speech of *Man*, may be further enquired. We see that *Beasts* haue those Parts, which they count the *Instruments* of Speech, (as *Lips, Teeth, &c.*) liker vnto *Man*, than *Birds*. As for the *Necke*, by which the *Throat* passeth; we see many *Beasts* haue it, for the Length, as much as *Birds*. What better *Gorge*, or *Attire*, *Birds* haue, may be further enquired. The *Birds* that are knowne to be *Speakers*, are *Parrots, Pies, Iayes, Dawes, and Ravens*. Of which, *Parrots* haue an adanque Bill, but the rest not.

But I conceiue, that the *Aptnesse* of *Birds*, is not so much in the *Conformity* of the *Organs* of Speech, as in their *Attention*. For Speech must come by *Hearing* and *Learning*; And *Birds* giue more heed, and marke *Sounds*, more than *Beasts*; because naturally they are more delighted with them, and practise them more; As appeareth in their *Singing*. We see also, that those that teach *Birds* to sing, doe keep them *Working*, to increase their *Attention*. We see also, that *Cock-Birds*, amongst *Singing-Birds*, are euer the better *Singers*; which may be, because they are more liuely, and listen more.

*Labour*, and *Intention* to *imitate* voices, doth conduce much to *Imitation*: And therefore we see, that there be certaine *Pantomimi*, that will represent the voices of *Players* of *Entertainments*, so to life, as if you see them not, you would thinke they were those *Players* themselves; And so the *Voices* of other *Men* that they heare.

There haue beene some, that could counterfeit the *Distance* of *Voices* (which is a *Secondary Object* of *Hearing*) in such sort; As when they stand fast by you, you would thinke the Speech came from a farre off, in a fearefull manner. How this is done, may be further enquired. But I see no great vse of it, but for *Imposture*, in counterfeiting *Ghosts* or *Spirits*.

There be three Kinds of *Reflexions* of *Sounds*; A *Reflexion* *Concurrent*; A *Reflexion* *Iterant*, which we call *Eccho*; And a *Super-reflexion*, or an *Eccho* of an *Eccho*, whereof the first hath beene handled in the Title of *Magnitude* of *Sounds*: The latter two we will now speake of.

The *Reflexion* of *Species* *Visible*, by *Mirrors*, you may command; Because passing in *Right Lines*, they may be guided to any Point: But the *Reflexion* of *Sounds* is hard to master; Because, the *Sound* filling great Spaces in *Arched Lines*, cannot be so guided: And therefore we see there hath not beene practised, any Meanes to make *Artificiall Ecchos*. And no *Eccho* already knowne returneth in a very narrow Roome.

The *Naturall Ecchos* are made vpon *Walls, Woods, Rocks, Hills, and Bankes*; As for *Waters*, being neere, they make a *Concurrent Eccho*; But being

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being further off (as vpon a large River) they make an *Iterant Echo*: For there is no difference betweene the *Concurrent Echo*, and the *Iterant*, but the Quicknesse, or Slownesse of the Returne. But there is no doubt, but *Water* doth help the *Delation* of *Echo*; as well as it helpeth the *Delation* of *Originall Sounds*.

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It is certaine (as hath beene formerly touched,) that if you speake thorow a *Trunke*, stopped at the further end, you shall finde a Blast returne vpon your Mouth, but no *Sound* at all. The *Cause* is, for that the *Closenesse*, which preserveth the *Originall*, is not able to preserve the *Reflected Sound*: Besides that *Echo's* are seldome created but by loud *Sounds*. And therefore there is lesse hope of *Artificiall Echoes* in *Aire*, pent in a narrow *Concaue*. Neuerthelesse it hath bin tried, that One leaning over a *Well*, of 25. Fathoms deep, and speaking, though but softly, (yet not so soft as a whisper) the *Water* returned a good *Audible Echo*. It would be tried, whether Speaking in *Caves*, where there is no Issue, save where you speake, will not yeeld *Echo's*, as *Wells* doe.

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The *Echo* commeth as the *Originall Sound* doth, in a Round Orbe of *Aire*: It were good to try the Creating of the *Echo*, where the Body *Repercussing* maketh an Angle: As against the Returne of a Wall, &c. Also we see that in *Mirrors*, there is the like Angle of Incidence, from the Object to the Glasse, and from the Glasse to the Eye. And if you strike a Ball side-long, not full vpon the Surface, the Rebound will be as much the contrary way, whether there be any such *Resilience* in *Echo's*, (that is, whether a Man shall heare better, if he stand aside the Body *Repercussing*, than if he stand where he speaketh, or any where in a right Line betweene,) may be tried. Triall likewise would be made, by standing neerer the Place of *Repercussing*, than hee that speaketh; And againe by standing further off, than hee that speaketh; And so Knowledge would be taken, whether *Echo's*, as well as *Originall Sounds*, be not strongest neere hand.

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There be many Places, where you shall heare a Number of *Echo's*, one after another: And it is when there is variety of *Hills* or *Woods*, some neerer, some further off: So that the Returne from the further, being last created, will be likewise last heard.

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As the *Water* goeth round, as well towards the Backe, as towards the Front of him that speaketh; So likewise doth the *Echo*; For you haue many Back *Echo's* to the Place where you stand.

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To make an *Echo*, that will report, three, or foure, or five Words, distinctly, it is requisite, that the Body *Repercussing*, be a good distance off: For if it be neere, and yet not so neere, as to make a *Concurrent Echo*, it choppeth with you vpon the sudden. It is requisite likewise, that the *Aire* be not much pent. For *Aire*, at a great distance, pent, worketh the same effect with *Aire*, at large, in a small distance. And therefore in the Triall of Speaking in the *Well*, though the *Well* was deepe, the *Voice* came backe, suddenly: And would beare the Report but of two Words.

For



For *Eccho's* vpon *Eccho's*, there is a rare Instance thereof in a Place, which I will now exactly describe. It is some three or foure Miles from *Paris*, neere a Towne called *Pont-charenton*; And some Bird-bolt shot, or more, from the River of *Seane*. The Roome is a *Chappell*, or small *Church*. The Walls all standing, both at the Sides, and at the Ends. Two Rowes of Pillars, after the manner of Isles of *Churches*, also standing; The Rooffe all open, not so much as any Embowment neere any of the walls left. There was against euery Pillar, a Stacke of Billets, aboue a Mans Height; which the Watermen, that bring Wood downe the *Seane* in Stacks, and not in Boats, laid there (as it seemeth) for their ease. Speaking at the one End, I did heare it returne the Voice thirteene seuerall times; And I haue heard of others, that it would returne sixteene times: For I was there about three of the Clocke in the Afternoone: And it is best (as all other *Eccho's* are) in the Euening. It is manifest, that it is not *Eccho's* from seuerall places, but a *Tossing* of the Voice, as a Ball, to and fro; Like to *Reflexions* in *Looking-Glasses*; where if you place one *Glasse* before, and another behind, you shall see the *Glasse* behind with the *Image*, within the *Glasse* before; And againe, the *Glasse* before in that; and diuers such *Super-Reflexions*, till the *species speciei* at last die. For it is euery Returne weaker, and more shady. In like manner, the *Voice* in that *Chappell*, createth *speciem speciei*, and maketh succeeding *Super-Reflexions*; For it melteth by degrees, and euery *Reflexion* is weaker than the former: So that, if you speak three Words, it will (perhaps) some three times report you the whole three Words; And then the two latter Words for some times; And then the last Word alone for some times; Still fading and growing weaker. And whereas in *Eccho's* of one Returne, it is much to heare foure or fife Words; In this *Eccho* of so many Returnes, vpon the matter, you heare aboue twenty Words for three.

The like *Eccho* vpon *Eccho*, but onely with two Reports, hath beene obserued to be, if you stand betweene a *Houfe*, and a *Hill*, and lure towards the *Hill*. For the *Houfe* will giue a *Back-Eccho*; One taking it from the other, and the latter the weaker.

There are certaine *Letters*, that an *Eccho* will hardly expresse; As *S*, for one; Especially being Principiall in a Word. I remember well, that when I went to the *Eccho* at *Pont-Charenton*, there was an Old *Parisian*, that tooke it to the Worke of Spirits, and of good Spirits. For (said he) call *Satan*, and the *Eccho* will not deliuer backe the Deuils name; But will say, *Vat'en*; Which is as much in *French*, as *Apage*, or *Avoid*. And thereby I did hap to finde, that an *Eccho* would not returne *S*, being but a Hissing and an *Interiour Sound*.

*Eccho's* are some more sudden, and chop againe, as soone as the *Voice* is deliuered; As hath beene partly said: Others are more deliberate, that is, giue more Space betweene the *Voice* and the *Eccho*, which is caused by the locall Nearenesse, or Distance: Some will report a longer Train of Words; And some a shorter: Some more loud (full as loud as the Ori-

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ginal, and sometimes more loud;) And some weaker and fainter.

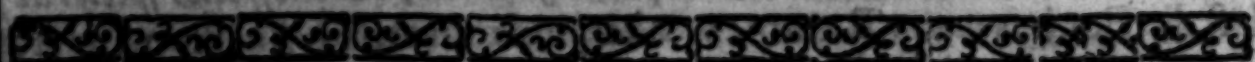
Where *Echo's* come from severall Parts, at the same distance, they must needs make (as it were) a Quire of *Echo's*, and so make the Report greater, and even a *Continued Echo*; which you shall find in some *Hills*, that stand encompassed, Theater-like.

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It doth not yet appeare, that there is *Refraction* in *Sounds*, as well as in *Species Visible*. For I do not think, that if a *Sound* should passe through diuers *Mediums*, (as *Aire*, *Cloth*, *Wood*) it would deliuer the *Sound*, in a differing Place, from that vnto which it is deferred; which is the Proper Effect of *Refraction*. But *Maieration*, which is also the Worke of *Refraction*, appeareth plainly in *Sounds* (as hath beene handled at full;) But it is not by Diuersity of *Mediums*.

Experiments  
in Confort  
touching the  
Consent and  
Dissent between  
Visibles and  
Audibles.

We haue *obiter*, for Demonstrations sake, vsed in diuers *Instances*, the *Examples* of the *Sight*, and *Things Visible*, to illustrate the *Nature* of *Sounds*. But we thinke good now to prosecute that *Comparison* more fully.



## CONSENT OF VISIBLES, and Audibles.

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**B**oth of them spread themselves in Round, and fill a whole Floare or Orbe, vnto certaine Limits: And are carried a great way: And doe languish and lessen by degrees, according to the Distance of the Obiects from the Sensories.

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Both of them haue the whole *Species* in euery small Portion of the *Aire*, or *Medium*; So as the *Species* doe passe through small Crannies, without Confusion: As we see ordinarily in *Lenels*, as to the *Eye*; And in *Crannies*, or *Chinks*, as to the *Sound*.

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Both of them are of a sudden and easie Generation and Delation; And likewise perish swiftly, and suddenly; As if you remoue the *Light*; Or touch the *Bodies* that giue the *Sound*.

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Both of them doe receiue and carry exquisite and accurate Differences; As of Colours, Figures, Motions, Distances, in *Visibles*; And of Articulate Voices, Tones, Songs, and Quauerings, in *Audibles*.

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Both of them in their Vertue and Working, doe not appeare to emit any Corporall Substance into their *Mediums*, or the Orbe of their Vertue; Neither againe to raise or stir any euident local Motion in their *Mediums*, as they passe; but onely to carry certaine Spirituall Species; The perfect Knowledge of the Cause whereof, being hitherto scarcely attained, we shall search and handle in due place.

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Both of them seeme not to generate or produce any other Effect in Nature,



ture, but such as appertaineth to their proper Obiects, and Senses, and are otherwise Barren.

But *Both* of them in their owne proper Action, doe worke three manifest Effects. The first, in that the *Stronger Species drowneth the Lesser*; As the Light of the Sunne, the light of a Glow-worme; The Report of an Ordnance, the Voice: The Second, in that an *Obiect of Surcharge or Excesse destroyeth the Sense*; As the Light of the Sunne the Eye, a violent Sound (neere the Eare) the Hearing: The Third, in that *both of them will be reuerberate*; As in *Mirroures*; And in *Eccho's*.

*Neither* of them doth destroy or hinder the Species of the other, although they encounter in the same Medium; As Light or Colour hinder not Sound; Nor *è contrà*.

*Both* of them affect the Sense in *Living Creatures*, and yeeld Obiects of Pleasure and Dislike: Yet neuerthelesse, the Obiects of them doe also (if it be well obserued) affect and worke vpon dead Things; Namely, such as haue some Conformity with the *Organs* of the two Senses; As *Visibles* worke vpon a *Looking-Glasse*, which is like the Papill of the Eye; And *Audibles* vpon the Places of *Eccho*, which resemble, in some sort, the *Cauerne* and structure of the Eare.

*Both* of them doe diuersly worke, as they haue their Medium diuersly disposed. So a Trembling Medium (as Smoake) maketh the Obiect seeme to tremble; and a Rising or Falling Medium (as Winds) maketh the Sounds to rise, or fall.

To *Both*, the Medium, which is the most Propitious and Conducible, is *Aire*; For *Glasse* or *Water*, &c. are not comparable.

In *Both* of them, where the Obiect is *Fine and Accurate*, it conduceth much to haue the Sense *Intentive, and Erect*; In so much as you contract your Eye, when you would see sharply; And erect your Eare, when you would heare attentiuely; which in Beasts that haue Eares moueable, is most manifest.

The *Beames* of Light, when they are multiplied and conglomerate, generate Heat; which is a different Action, from the Action of Sight: And the Multiplication and Conglomeration of Sounds doth generate an extreme Rarefaction of the *Aire*; which is an Action materiate, differing from the Action of Sound; If it be true (which is anciently reported) that *Birds*, with great shouts, haue fallen downe.



## DISSENTS OF VISIBLES, and Audibles.

268 **T**He *Species* of *Visibles* seeme to be *Emissions* of *Beames* from the *Object* scene; Almost like *Odours*; saue that they are more *Incorporeall*: But the *Species* of *Audibles* seeme to Participate more with *Locall Motion*, like *Percussions* or *Impressions* made vpon the *Aire*. So that whereas all Bodies doe seeme to worke in two manners; Either by the *Communication* of their *Natures*; Or by the *Impressions* and *Signatures* of their *Motions*; The *Diffusion* of *Species Visible* seemeth to participate more of the former *Operation*; and the *Species Audible* of the latter.

269 The *Species* of *Audibles* seeme to be carried more manifestly thorow the *Aire*, than the *Species* of *Visibles*: For (I conceiue) that a Contrary strong Wind will not much hinder the Sight of *Visibles*, as it will doe the Hearing of *Sounds*.

270 There is one *Difference*, aboue all others, betweene *Visibles* and *Audibles*, that is the most remarkable; As that whereupon many smaller Differences doe depend: Namely, that *Visibles*, (except *Lights*,) are carried in *Right Lines*; and *Audibles* in *Arcuate Lines*. Hence it commeth to passe, that *Visibles* doe not intermingle, and confound one another, as hath beene said before; But *Sounds* doe. Hence it commeth, that the Solidity of Bodies doth not much hinder the Sight, so that the Bodies be cleare, and the Pores in a Right Line, as in Glasse, Crystall, Diamonds, Water, &c. But a thin Scarfe, or Handkerchiefe, though they be Bodies nothing so Solid, hinder the Sight: Whereas (contrariwise) these Porous Bodies doe not much hinder the Hearing, but solid Bodies doe almost stop it, or at the least attenuate it. Hence also it commeth, that to the *Reflexion* of *Visibles*, small Glasses suffice; but to the *Reuerberation* of *Audibles*, are required greater Spaces, as hath likewise beene said before.

271 *Visibles* are scene further off, than *Sounds* are heard; Allowing neuertheless the *Rate* of their *Bignesse*: For otherwise a great *Sound* will bee heard further off, than a *Small Body* scene.

272 *Visibles* require (generally) some *Distance* betweene the *Object*, and the *Eye*, to bee better scene; Whereas in *Audibles*, the neerer the Approach of the *Sound* is to the Sense, the better. But in this there may be a double Error. The one, because to *Seeing*, there is required *Light*; And any thing that toucheth the Pupill of the Eye (all ouer) excludeth the *Light*. For I haue heard of a Person very credible (who himselfe was cured



cured of a Cataract in one of his Eyes) that while the Silver Needle did worke vpon the Sight of his Eye, to remoue the Filme of the Cataract, he neuer saw any thing more cleere or perfect, than that white Needle: Which (no doubt) was, because the Needle was lesse than the *Pupill* of the *Eye*, and so tooke not the Light from it. The other Error may be, for that the *Object* of *Sight* doth strike vpon the *Pupill* of the *Eye*, directly without any interception; whereas the *Cane* of the *Eare* doth hold off the *Sound* a little from the Organ: And so neuerthelesse there is some *Distance* required in both.

*Visibles* are swifter carried to the *Sense*, than *Audibles*; As appeareth in Thunder and Lightning; Flame and Report of a Peece; Motion of the Aire in Hewing of Wood. All which haue beene set downe heretofore, but are proper for this *Title*.

I conceiue also, that the *Species of Audibles* doe hang longer in the Aire, than those of *Visibles*: For although euen those of *Visibles*, doe hang some time, as we see in *Rings turned*, that shew like Spheres; In *Lute-strings* filipped; A *Fire-brand* carried along, which leaue a Train of Light behind it; and in the *Twilight*; And the like: Yet I conceiue that *Sounds* stay longer, because they are carried vp and downe with the Winde: And because of the Distance of the Time in *Ordinance discharged*, and heard twenty Miles off.

In *Visibles*, there are not found *Objects* so odious and ingrate to the *Sense*, as in *Audibles*. For foule *Sights* doe rather displease, in that they excite the Memory of foule Things, than in the immediate *Objects*. And therefore in *Pictures*, those foule *Sights* doe not much offend; But in *Audibles*, the Grating of a Saw, when it is sharpned, doth offend so much, as it setteth the Teeth on Edge. And any of the *harsh Discords* in *Musicke*, the *Eare* doth straight-waies refuse.

In *Visibles*, after great Light, if you come suddenly into the *Darke*; Or contrariwise, out of the *Darke* into a *Glaring light*, the Eye is dazled for a time, and the *Sight* confused; But whether any such Effect be after great *Sounds*, or after a *deepe Silence*, may be better enquired. It is an old Tradition, that those that dwell neere the *Cataracts* of *Nilus*, are stricken deafe: But we finde no such effect, in Cannoniers, nor Millers, nor those that dwell vpon Bridges.

It seemeth that the *Impression of Colour* is so weake, as it worketh not but by a Cone of Direct *Beames*, or Right Lines; whereof the Basis is in the *Object*; and the Verticall Point in the *Eye*; So as there is a Corradiation and Coniunction of *Beames*; And those *Beames* so sent forth, yet are not of any force to beget the like borrowed or second *Beames*, except it be by *Reflexion*, whereof we speake not. For the *Beames* passe, and giue little Tincture to that Aire, which is Adiacent; which if they did, we should see *Colours* out of a Right line. But as this is in *Colours*, so otherwise it is in the *Body of Light*. For when there is a Skreene betweene the Candle and the Eye, yet the *Light* passeth to the Paper wheron One writeth; So that the *Light* is scene, where the *Body of the Flame* is not

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scene; And where any *Colour* (if it were placed where the Body of the *Flame* is) would not be scene. I iudge that *Sound* is of this Latter Nature: For when two are placed on both sides of a Wall, and the Voice is heard, I iudge it is not onely the *Originall Sound*, which passeth in an *Arched Line*; But the *Sound*, which passeth about the Wall in a Right Line, begetteth the like Motion round about it, as the first did, though more weake.

**A**LL *Concords* and *Discords* of *Musicke*, are, (no doubt) *Sympathies*, and *Antipathies* of *Sounds*. And so (likewise) in that *Musicke*, which wee call *Broken Musicke*, or *Consort Musicke*; Some *Consorts* of *Instruments* are sweeter than others; (A Thing not sufficiently yet obserued:) As the *Irish Harpe*, and *Base Viall* agree well: The *Recorder* and *Stringed Musicke* agree well: *Organs* and the *Voice* agree well; &c. But the *Virginalls* and the *Lute*; Or the *Welsh-Harpe*, and *Irish Harpe*; Or the *Voice* and *Pipes* alone, agree not so well; But for the *Melioration* of *Musicke*, there is yet much left (in this Point of *Exquisite Consorts*) to try and enquire.

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There is a Common Obseruation, that if a *Lute*, or *Viall*, be layed vpon the Backe, with a small Straw vpon one of the *Strings*; And another *Lute* or *Viall* bee laid by it; And in the other *Lute* or *Viall*, the *Vnison* to that *String* be stricken; it will make the *String* moue; Which will appeare both to the Eye, and by the *Strawes* falling off. The like will bee, if the *Diapason* or *Eight* to that *String* be stricken, either in the same *Lute* or *Viall*, or in others lying by; But in none of these there is any Report of *Sound*, that can be discerned, but only Motion.

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It was deuised, that a *Viall* should haue a Lay of Wire Strings below, as close to the Belly, as a *Lute*; And then the *Strings* of Guts mounted vpon a Bridge, as in Ordinary *Vialls*; To the end, that by this means, the vpper *Strings* stricken, should make the lower resound by *Sympathy*, and so make the *Musicke* the better; Which, if it be to purpose, then *Sympathy* worketh, as well by Report of *Sound*, as by Motion. But this deuice I conceiue to be of no vse; because the vpper *Strings*, which are stopped in great variety, cannot maintaine a *Diapason* or *Vnison*, with the Lower, which are neuer stopped. But if it should be of vse at all; it must be in *Instruments* which haue no Stops; as *Virginalls*, and *Harpes*; wherein triall may be made of two Rows of *Strings*, distant the one from the other.

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The *Experiment* of *Sympathy* may be transferred (perhaps) from *Instruments* of *Strings*, to other *Instruments* of *Sound*. As to try if there were in one Steeple, two *Bells* of *Vnison*, whether the striking of the one would moue the other, more than if it were another Accord: And so in *Pipes* (if they be of equall Bore, and *Sound*) whether a little Straw or Feather would moue in the one *Pipe*, when the other is blowne at an *Vnison*.

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It seemeth, both in *Eare*, and *Eye*, the *Instrument* of *Sense* hath a *Sympathy* or *Similitude* with that which giueth the *Reflexion*; (As hath beene touched before.) For as the *Sight* of the *Eye* is like a *CrySTALL*, or *Glas*, or *Water*; So is the *Eare* a *sinuous Caue*, with a *hard Bone*, to stop and reuerberate the *Sound*: Which is like to the *Places* that report *Eccho's*.

When a Man *Tawneth*, he cannot *Heare* so well. The *Cause* is, for that the *Membrane* of the *Eare* is extended; And so rather casteth off the *Sound*, than draweth it to.

We *Heare* better when we hold our *Breath*, than contrary: In so much as in all *Listening* to attaine a *Sound* a *farre* off, Men hold their *Breath*. The *Cause* is, For that in all *Expiration*, the *Motion* is *Outwards*; And therefore, rather driueth away the *voice*, than draweth it: And besides we see, that in all *Labour* to doe things with any *strength*, we hold the *Breath*: And *listening* after any *Sound*, that is heard with *difficulty*, is a kinde of *Labour*.

Let it be tried, for the *Helpe* of the *Hearing*, (and I conceiue it likely to succeed,) to make an *Instrument* like a *Tunnell*; The narrow Part whereof may be of the *Bignesse* of the *Hole* of the *Eare*, And the *Broader End* much larger, like a *Bell* at the *Skirts*; And the *length* halfe a *foot*, or more. And let the narrow end of it be set close to the *Eare*. And marke whether any *Sound*, abroad in the open *Aire*, will not be heard distinctly, from further distance, than without that *Instrument*; being (as it were) an *Eare-Spectacle*. And I haue heard there is in *Spaine*, an *Instrument* in vse to be set to the *Eare*, that helpeth somewhat those that are *Thicke* of *Hearing*.

If the *Mouth* bee shut close, neuerthelesse there is yeelded by the *Roofe* of the *Mouth*, a *Murmur*. Such as is vsed by dumbe Men: But if the *Nostrills* be likewise stopped, no such *Murmur* can be made; Except it be in the *Bottom* of the *Pallate* towards the *Throat*. Whereby it appeareth manifestly, that a *Sound* in the *Mouth*, except such as afore-said, if the *Mouth* bee stopped, passeth from the *Pallat*, thorow the *Nostrills*.

The *Repercussion* of *Sounds*, (which wee call *Eccho*;) is a great *Argument* of the *Spiritual* *Essence* of *Sounds*. For if it were *Corporall*, the *Repercussion* should be created in the same manner, and by like *Instruments*, with the *Originall Sound*: But we see what a *Number* of *Exquisite Instruments* must concur in *Speaking* of *Words*, whereof there is no such *Matter* in the *Returning* of them; But only a *plaine Stop*, and *Repercussion*.

The *Exquisite Differences* of *Articulate Sounds*, carried along in the *Aire*, shew that they cannot be *Signatures* or *Impressions* in the *Aire*, as hath beene well refuted by the *Ancients*. For it is true, that *Seales* make excellent *Impressions*: And so it may be thought of *Sounds* in their

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Experiments  
in Consort tou-  
ching the Hin-  
dering or Hel-  
ping of the Hea-  
ring.

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Experiments  
in Consort,  
touching the  
*Spiritual* and  
*Fine Nature* of  
*Sounds*.

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their first Generation: But then the *Delation* and *Continuance* of them without any new Sealing, shew apparently they cannot bee Impressions.

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All *Sounds* are suddenly made, and doe suddenly perish; But neither that, nor the *Exquisite Differences* of them, is Matter of so great Admiration: For the Quauerings, and Warblings in Lutes, and Pipes, are as swift; And the Tongue, (which is no very fine Instrument,) doth in Speech, make no fewer Motions, than there be Letters in all the Words, which are vttered. But that *Sounds* should not only be so speedily generated, but carried so farre euery way, in such a momentanie time, deserueth more Admiration. As for Example; If a Man stand in the middle of a Field, and speake aloud, he shall be heard a Furlong in round; And that shall be in *Articulate Sounds*; And those shall be Entire in euery little Portion of the *Aire*; And this shall be done in the Space of lesse than a Minute.

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The *Sudden Generation* and *Perishing* of *Sounds*, must be one of these two Ways. Either that the *Aire* suffereth some Force by *Sound*; and then restoreth it selfe; As Water doth; Which being diuided, maketh many Circles, till it restore it selfe to the naturall Consistence: Or otherwise, that the *Aire* doth willingly imbibe the *Sound* as gratefull, but cannot maintaine it; For that the *Aire* hath (as it should seeme) a secret and hidden Appetite of Recciuing the *Sound* at the first; But then other Grosse and more Materiate Qualities of the *Aire* straightwayes suffocate it; Like vnto *Flame*, which is generated with Alacritie, but straight quenched by the Enmitie of the *Aire*, or other Ambient Bodies.

There be these *Differences* (in generall) by which *Sounds* are diuided; 1. *Musicall*, *Immusicall*; 2. *Treble*, *Base*; 3. *Flat*, *Sharpe*; 4. *Soft*, *Loud*; 5. *Exteriour*, *Interiour*; 6. *Cleane*, *Harsh* or *Purling*; 7. *Articulate*, *Inarticulate*.

We haue laboured (as may appeare,) in this *Inquisition* of *Sounds*, diligently; Both because *Sound* is one of the most Hidden Portions of *Nature*, (as we said in the beginning:) And because it is a *Vertue* which may be called *Incorporeall*, and *Immateriate*; whereof there be in *Nature* but few. Besides, we were willing, (now in these our first *Centuries*,) to make a Patterne or President of an *Exact Inquisition*; And we shall doe the like hereafter in some other Subiects which require it. For wee desire that Men should learne and perceiue, how seruere a Thing the true *Inquisition* of *Nature* is; And should accustom



custome themselves, by the light of Particulars, to enlarge their Mindes, to the Amplitude of the world; And not reduce the World to the Narrowness of their Mindes.

**M**etalls giue *Orient* and *Fine Colours* in *Dissolutions*; As *Gold* giueth an excellent *Yellow*; *Quick-Siluer* an excellent *Green*; *Tin* giueth an excellent *Azure*: Likewise in their *Puifications*, or *Rusts*; As *Vermilion*, *Verdegrease*, *Bise*, *Cirrus*, &c. And likewise in their *Vitrifications*. The Cause is, for that by their Strength of Body, they are able to endure the Fire, or Strong Waters, and to be put into an Equall Posture; And againe to retaine Part of their principall Spirit; Which two Things, (Equall Posture, and Quicke Spirits) are required chiefly, to make Colours lightsome.

Experiment  
Solitary touch-  
ing the Ori-  
ent Colours in  
dissolution of  
Metalls.

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**I**T conduceth vnto *Long Life*, and to the more Placide motion of the Spirits, which thereby doe lesse prey and consume the Iuyce of the Body; Either that *Mens Actions be free and voluntary*; That nothing be done *Inuitâ Minervâ*, but *Secundum Genium*: Or on the other side, that the *Actions of Men be full of Regulation, and Commands within themselves*: For then the Victory and Performing of the Command, giueth a good Disposition to the Spirits; Especially if there be a Proceeding from Degree to Degree; For then the Sense of Victory is the greater. An example of the former of these, is in a Country life; And of the latter, in *Monkes* and *Philosophers*, and such as doe continually enioyne themselves.

Experiment  
Solitary touch-  
ing Prolonga-  
tion of Life.

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**I**T is certaine, that in all Bodies, there is an *Appetite of Vnion*, and E-  
litation of Solution of Continuities: And of this *Appetite* there be many *Degrees*; But the most Remarkable, and fit to be distinguished, are three. The first in *Liquors*; The second in *Hard Bodies*: And the third in *Bodies Cleaning* or *Tenacious*. In *Liquors*, this *Appetite* is weake: We see in *Liquors*, the *Thredding* of them in *Stillicides*, (as hath beene said;) The *Falling* of them in *Round Drops*, (which is the forme of *Vnion*;) And the *Staying* of them, for a little time, in *Bubbles* and *Froth*. In the second *Degree* or *Kinde*, this *Appetite* is strong; As in *Iron*, in *Stone*, in *Wood*, &c. In the third, this *Appetite* is in a *Medium* betweene the other two: For such *Bodies* doe partly follow the Touch of another Bodie; And partly sticke and continue to themselves; And therefore they roape, and draw themselves in Threds; As we see in *Pitch*, *Glew*, *Birdlime*, &c. But note, that all *Solide Bodies* are *Cleaning*, more or lesse: And that they loue better the Touch of somewhat that is *Tangible*, than of *Aire*. For *Water*, in small quantitie, cleaueth to any Thing that is *Solide*; And so would *Metall* too, if the weight drew it not off. And therefore *Gold Foliate*, or any *Metall Foliate*, cleaueth: But those *Bodies* which are noted to be *Clammie*, and *Cleaving*, are such, as haue a more indifferent *Appetite* (at once,) to follow another Bodie; And to hold to them-

Experiment  
Solitary touch-  
ing Appetite  
of Vnion in Bo-  
dies.

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themselves. And therefore they are commonly *Bodies* ill mixed; And which take more pleasure in a Forraine Body, than in preserving their owne *Consistence*; And which have little predominance in *Drought*, or *Moisture*.

Experiment  
Solitary touching the like  
Operations of  
Heat, and Time

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**T**ime, and Heat, are Fellowes in many Effects. Heat drieth Bodies, that doe easily expire; As Parchment, Leaues, Roots, Clay, &c. And, so doth Time or Age arefie; As in the same Bodies, &c. Heat dissolueth and melteth Bodies, that keepe in their Spirits; As in diuers *Liquefactions*; And so doth Time, in some Bodies of a softer Consistence: As is manifest in Honey, which by Age waxeth more liquid; And the like in Sugar; And so in old Oyle, which is euer more cleare, and more hot in Medicinable vse. Heat causeth the Spirits to search some Issue out of the Body; As in the *Volatility* of *Metalls*; And so doth Time; As in the *Rust* of *Metalls*. But generally Heat doth that in small time, which Age doth in long.

Experiment  
Solitary touching the differing  
Operations of Fire, and  
Time.

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**S**ome things which passe the Fire are softest at first, and by Time grow Shard; As the Crumme of Bread. Some are harder when they come from the Fire, and afterwards giue againe, and grow soft, as the Crust of Bread, Bisket, Sweet Meats, Salt, &c. The Cause is, for that in those things which wax Hard with Time, the Worke of the Fire is a Kinde of *Melting*: And in those that wax Soft with Time, (contrariwise,) the worke of the Fire is a Kinde of *Baking*; And whatsoever the Fire baketh, Time doth in some degree dissolue.

Experiment  
Solitary touching  
Motions by Imitation.

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**M**otions passe from one Man to another, not so much by Exciting Imagination; as by Inuitation; Especially if there be an Aptnesse or Inclination before. Therefore *Gaping*, or *Yawning*, and *Stretching* doe passe from Man to Man; For that that causeth *Gaping* and *Stretching* is, when the Spirits are a little Heauy, by any Vapour, or the like. For then they strue, (as it were,) to wring out, and expell that which loadeth them. So Men drowzie, and desirous to sleepe; Or before the Fit of an Ague; doe vse to Yawne and Stretch; And doe likewise yeeld a *Voice* or *Sound*, which is an *Interiection* of *Expulsion*: So that if another be apt and prepared to doe the like, he followeth by the Sight of another. So the *Laughing* of another maketh to *Laugh*.

Experiment  
Solitary touching  
Infectious  
Diseases.

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**T**here be some knowne *Diseases* that are *Infectious*; And Others that are not. Those that are *Infectious*, are; First, such as are chiefly in the *Spirits*, and not so much in the *Humours*; And therefore passe easily from Bodie to Bodie: Such are *Pestilences*, *Lippitudes*, and such like. Secondly, such as Taint the *Breath*; Which wee see passeth manifestly from Man to Man; And not inuisibly, as the *Affects* of the *Spirits* doe: Such are *Consumptions* of the *Lungs*, &c. Thirdly, such as come forth to the *Skinne*; And therefore taint the *Aire*, or the *Body* *Adiacent*;



*Adjacent*; Especially if they consist in an Vnctuous Substance, not apt to dissipate; Such are *Scabs*, and *Leprouse*. Fourthly, such as are meere-ly in the *Humours*, and not in the *Spirits*, *Breath*, or *Exhalations*: And therefore they neuer infect, but by *Touch* only; And such a *Touch* also, as commeth within the *Epidermis*; As the Venome of the *French Pox*; And the *Biting* of a *Mad Dog*.

**M**ost *Powders* grow more Close and Coherent by *Mixture* of *Water*, than by *Mixture* of *Oyle*, though *Oyle* be the thicker Bodie; As *Meale*; &c. The Reason is the Congruitie of Bodies; which if it be more, maketh a Perfecter Imbibition, and Incorporation; Which in most *Powders* is more betweene *Them* and *Water*, than betweene *them*, and *Oyle*: But *Painters Colours* ground, and *Ashes*, doe better incorporate with *Oyle*.

Experiment  
Solitary tou-  
ching the In-  
corporation of  
Powders and  
Liquors.

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**M**uch *Motion* and *Exercise* is good for some *Bodies*; And *Sitting*, and *lesse Motion* for Others. If the Bodie be Hot, and Void of Superfluous Moistures, too much *Motion* hurteth: And it is an Errour in *Physitians*, to call too much vpon *Exercise*. Likewise Men ought to be-ware, that they vse not *Exercise*, and a *Spare Diet* both: But if much *Exercise*, then a *Plentifull Diet*; And if *Sparing Diet*, then little *Exercise*. The *Benefits* that come of *Exercise* are, First, that it sendeth *Nourishment* into the Parts more forcibly. Secondly, that it helpeth to Excerne by *Sweat*, and so maketh the Parts assimilate the more perfectly. Thirdly, that it maketh the *Substance* of the *Body* more *Solide* and *Compact*; And so lesse apt to be Consumed and Depredated by the *Spirits*. The *Euills* that come of *Exercise*, are: First, that it maketh the *Spirits* more Hot and Predatory. Secondly, that it doth absorbe likewise, and attenuate too much the Moisture of the *Body*. Thirdly, that it maketh too great *Con- cussion*, (especially if it be violent,) of the *Inward Parts*; which delight more in Rest. But generally *Exercise*, if it be much, is no Friend to *Pro- longation* of *Life*; Which is one cause, why *Women* liue longer than *Men*, because they stirre lesse.

Experiment  
Solitary tou-  
ching *Exercise*  
of the Bodie.

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**S**ome *Food* we may vse long, and much, without *Glutting*; As Bread, *Flesh* that is not fat, or rancke, &c. Some other, (though pleasant,) *Glutteth* sooner; As Sweet Meats, Fat Meats, &c. The *Cause* is, for that *Appetite* consisteth in the Emptinesse of the Mouth of the Sto- macke; Or possessing it with somewhat that is Astringent; And there- fore Cold and Drie. But things that are *Sweet* and *Fat*, are more Fil- ling: And doe swimme and hang more about the Mouth of the Sto- macke; And goe not downe so speedily: And againe turne sooner to *Choler*, which is hot, and euer abateth the Appetite. Wee see also, that another *Cause* of *Sacietie*, is an *Ouer-custome*; and of *Appetite* is *No- ueltie*: And therefore *Meats*, if the same be continually taken, induce *Loathing*. To giue the Reason of the *Distaste* of *Sacietie*, and of the Plea-  
sure

Experiment  
Solitary tou-  
ching Meats,  
that induce Sa-  
cietie.

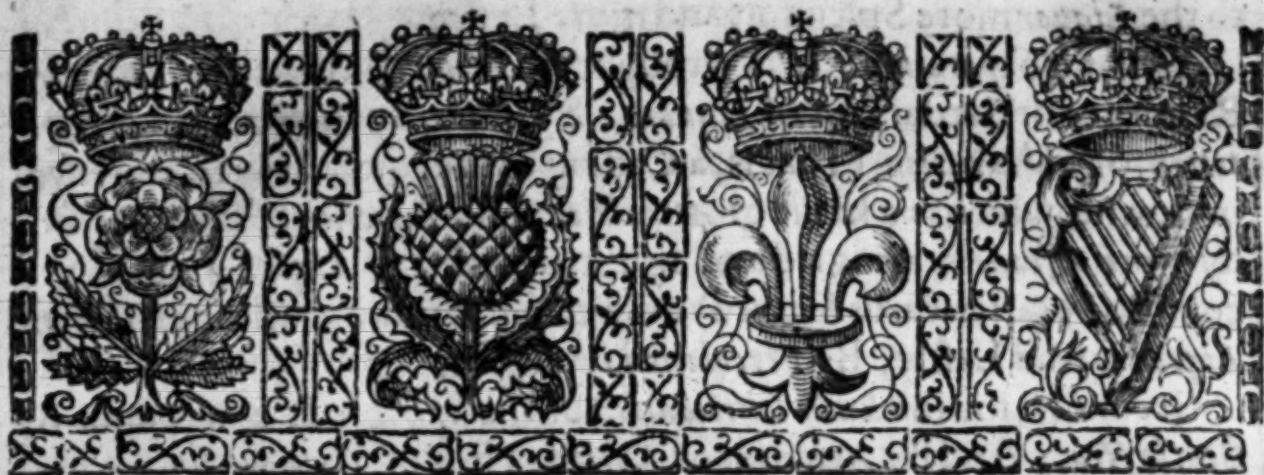
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sure in *Noveltie*; and to distinguish not onely in Meats and Drinkes, but also in Motions, Loues, Company, Delights, Studies, what they be that *Custom* maketh more gratefull; And what more tedious; were a large Field. But for *Meats*, the Cause is *Attraction*, which is quicker, and more excited toward that which is new, than towards that whereof there remaineth a Rellish by former vse. And (generally) it is a Rule, that whatsoever is somewhat Ingrate at first, is made Gratefull by *Custom*; But whatsoever is too Pleasing at first, groweth quickly to *satiate*.

NATV-





# NATVRALL HISTORIE.

## IV. Century.



ACCELERATION of *Time* in *Works* of *Nature*, may well be esteemed *Inter Magnalia Naturæ*. And euen in *Diuine Miracles*, *Accelerating* of the *Time*, is next to the *Creating* of the *Matter*. We will now therefore proceed to the Enquiry of it: And for *Acceleration* of *Germination*, we will referre it ouer,

vnto the place, where we shall handle the Subiect of *Plants*, generally; And will now begin with other *Accelerations*.

*Liquors* are (many of them) at the first, thicke and troubled; As *Must*, *Wort*, *Iuyces* of *Fruits*, or *Herbs* expressed, &c. And by *Time* they settle and Clarifie. But to make them cleare, before the *Time*, is a great *Work*; For it is a Spurre to *Nature*, and putteth her out of her pace: And besides, it is of good vse, for making *Drinckes*, and *Sauces*, Potable, and Seruiceable, speedily; But to know the *Meanes* of *Accelerating Clarification*, we must first know the *Causes* of *Clarification*. The first *Cause* is, by the *Separation* of the *Grosser Parts* of the *Liquor*, from the *Finer*. The second, by the *Equall Distribution* of the *Spirits* of the *Liquor*, with the *Tangible Parts*: For that euer representeth Bodies Cleare and Vntrou-

H

bled,

Experiments  
in Consort,  
touching the  
Clarification of  
*Liquors*, and  
the *Accelerating*  
thereof.



bled. The third, by the *Refining* the *Spirit* it selfe, which thereby giueth to the *Liquor* more Splendor, and more Lustre.

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First, for *Separation*; It is wrought by *Weight*; As in the ordinary Residence or Settlement of *Liquors*: By *Heat*: By *Motion*: By *Precipitation*, or *Sublimation*; (That is, a Calling of the seuerall Parts, either vp, or downe, which is a kinde of *Attraction*;) By *Adhesion*; As when a Body more *Viscous* is mingled and agitated with the *Liquor*; which Viscous Body (afterwards seuered) draweth with it the grosser parts of the *Liquor*: And Lastly, By *Percolation* or *Passage*.

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Secondly, for the *Even Distribution* of the *Spirits*; It is wrought By *Gentle Heat*; And By *Agitation* or *Motion*; (For of *Time* we speake not, because it is that, wee would anticipate and represent:) And it is wrought also, By *Mixture* of some other *Body*, which hath a vertue to open the *Liquor*, and to make the *Spirits* the better passe thorow.

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Thirdly, for the *Refining* of the *Spirit*, it is wrought likewise By *Heat*; By *Motion*; And by *Mixture* of some *Body* which hath *Vertue* to attenuate. So therefore (hauing shewne the *Causes*) for the *Accelerating* of *Clarification*, in generall, and the *Enducing* of it; take these *Instances*, and *Trialls*.

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It is in common Practise, to draw *Wine*, or *Beere*, from the *Lees*, (which we call *Racking*;) whereby it will *Clarifie* much the sooner: For the *Lees*, though they keepe the *Drinke* in Heart, and make it lasting; yet withall they cast vp some Spissitude: And this *Instance* is to be referred to *Separation*.

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On the other side, it were good to try, what the Adding to the *Liquour* more *Lees* than his owne will worke; For though the *Lees* doe make the *Liquor* turbide, yet they refine the *Spirits*. Take therefore a Vessell of *New Beere*; And take another Vessell of *New Beere*, and Rack the one Vessell from the *Lees*, and powre the *Lees* of the Racked Vessell into the vnacked Vessell, and see the Effect: This *Instance* is referred to the *Refining* of the *Spirits*.

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Take *New Beere*, and put in some Quantity of *Stale Beere* into it, and see whether it will not accelerate the *Clarification*, by Opening the Body of the *Beere*, and Cutting the Grosser Parts, wherby they may fall downe into *Lees*. And this *Instance* againe is referred to *Separation*.

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The longer *Malt*, or *Herbs*, or the like, are Infused in *Liquor*, the more thicke and troubled the *Liquor* is; But the longer they be decocted in the *Liquor*, the clearer it is. The Reason is plaine, because in *Infusion*, the longer it is, the greater is the Part of the Grosse Body, that goeth into the *Liquor*: But in *Decoction*, though more goeth forth, yet it either purgeth at the Top, or setleth at the Bottome. And therefore the most Exact Way to *Clarifie* is; First, to *Infuse*, and then to take off the *Liquor* and *Decoct* it; as they doe in *Beere*, which hath *Malt* first Infused in the *Liquor*, and is afterwards boiled with the Hop. This also is referred to *Separation*.

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Take *Hot Embers*, and put them about a Bottle filled with *New Beere*, almost



almost to the very Neck: Let the Bottle be well stopped, lest it fly out: And continue it, renewing the *Embers* euery day, by the space of Ten Daies; and then compare it with another Bottle of the same *Beere* set by. Take also Lime both *Quenched* and *Vnquenched*, and set the Bottles in them, *ut supra*. This *Instance* is referred, both to the *Euen Distribution*, and also to the *Refining* of the *Spirits* by *Heat*.

Take *Bottles*, and *Swing* them; Or *Carry* them in a *Whee-le-Barrow*, vpon *Rough Ground*; twice in a day: But then you may not fill the *Bottles* full, but leaue some *Aire*; For if the *Liquour* come close to the *Stopple*, it cannot play, nor flower: And when you haue shaken them well, either way, powre the *Drinke* into another Bottle, stopped close, after the vsuall manner; For if it stay with much *Aire* in it, the *Drinke* will pall; neither will it settle so perfectly in all the *Parts*. Let it stand some 24. houres: Then take it, and put it againe into a *Bottle* with *Aire*, *ut supra*: And thence into a *Bottle Stopped*, *ut supra*: And so repeat the same *Operation* for seuen daies. Note that in the Emptying of one Bottle into another, you must doe it swiftly, lest the *Drinke* pall. It were good also, to try it in a *Bottle* with a little *Aire* below the *Necke*, without Emptying. This *Instance* is referred to the *Euen Distribution* and *Refining* of the *Spirits* by *Motion*.

As for *Percolation*, *Inward* and *Outward*, (which belongeth to *Separation*,) Triall would be made, of *Clarifying* by *Adhesion*, with *Milke* put into *New Beere*, and stirred with it: For it may be that the *Grosser Part* of the *Beere* will cleaue to the *Milke*: The Doubt is, whether the *Milke* will seuer well againe; Which is soone tried. And it is vsuali in *Clarifying Ippocrasse* to put in *Milke*; Which after seuereth and carrieth with it the *Grosser Parts* of the *Ippocrasse*, as hath beene said elsewhere. Also for the better *Clarification* by *Percolation*, when they tun *New Beere*, they vse to let it passe thorow a *Strainer*; And it is like, the finer the *Strainer* is, the cleerer it will be.

The *Accelerating* of *Maturation* wee will now enquire of. And of *Maturation* it selfe. It is of three *Natures*. The *Maturation* of *Fruits*: The *Maturation* of *Drinks*: And the *Maturation* of *Impostumes* and *Vlcers*. This last we referre to another Place, where wee shall handle *Experiments Medicinall*. There be also other *Maturations*, as of *Metals*, &c. whereof we will speake as *Occasion* serueth. But we will begin with that of *Drinkes*, because it hath such *Affinity* with the *Clarification* of *Liquors*.

For the *Maturation* of *Drinks*, it is wrought by the *Congregation* of the *Spirits* together, whereby they digest more perfectly the *Grosser Parts*: And it is effected partly, by the same meanes, that *Clarification* is (whereof we spake before;) But then note, that an *Extreme Clarification* doth

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Experiments  
in Consort  
touching *Ma-  
turation*, and  
the *Accelerating*  
thereof. And  
first touching  
the *Maturation*  
and *Quickning*  
of *Drinks*. And  
next touching  
the *Maturation*  
of *Fruits*.

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spread the *Spirits* so Smooth, as they become Dull, and the *Drinke* dead, which ought to haue a little Flouring. And therefore all your Cleare *Amber Drinke* is flat.

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We see the *Degrees of Maturation of Drinke*; In *Must*; In *Wine*, as it is drunke; And in *Vinegar*. Whereof *Must* hath not the *Spirits* well Congregated; *Wine* hath them well vnited; so as they make the Parts somewhat more Oylie: *Vinegar* hath them Congregated, but more Ieiune, and in smaller Quantity; The greatest and finest Spirit and Part being exhaled: For we see *Vinegar* is made by setting the Vessel of *Wine* against the hot Sun: And therefore *Vinegar* will not burne; For that much of the Finer Parts is Exhaled.

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The *Refreshing* and *Quickning* of *Drinke* Palled, or Dead, is by *Enforcing* the *Motion* of the *Spirit*: So we see that *Open Weather* relaxeth the *Spirit*, and maketh it more liuely in *Motion*. Wee see also *Bottelling* of *Beere*, or *Ale*, while it is New, and full of *Spirit* (so that it spirteth when the Stopple is taken forth) maketh the *Drinke* more quicke and windy. A *Pan* of *Coales* in the *Cellar* doth likewise good, and maketh the *Drinke* worke againe. *New Drinke*, put to *Drinke* that is *Dead*, prouoketh it to worke againe: Nay, which is more (as some affirme) *A Brewing of New Beere*, set by *Old Beere*, maketh it worke againe. It were good also to *Enforce* the *Spirits* by some *Mixtures* that may excite and quicken them; As by Putting into the *Bottles*, *Nitre*, *Chalke*, *Lime*, &c. We see *Creame* is *Matured*, and made to rise more speedily, by Putting in *Cold Water*; which, as it seemeth, getteth downe the *Whey*.

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It is tried, that the *Burying* of *Bottles of Drinke* well stopped, either in *dry Earth*, a good depth; Or in the *Bottom* of a *Well* within *Water*; And best of all the *Hanging* of them in a *deepe Well* somewhat *aboue the Water*, for some fortnights space, is an Excellent *Meanes* of making *Drinke* fresh, and quicke: for the *Cold* doth not cause any *Exhaling* of the *Spirits* at all; As *Heat* doth, though it rarifieth the rest that remaine: But *Cold* maketh the *Spirits* vigorous, and irritateth them, whereby they Incorporate the Parts of the *Liquor* perfectly.

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As for the *Maturation of Fruits*; It is wrought by the *Calling forth* of the *Spirits of the Body outward*, and so *Spreading* them more *smoothly*: And likewise by *Digesting*, in some degree, the *Grosser Parts*: And this is Effected, by *Heat*; *Motion*; *Attraction*; And by a *Rudiment of Putrefaction*: For the *Inception of Putrefaction* hath in it a *Maturation*.

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There were taken *Apples*, and laid in *Straw*; In *Hay*; In *Flower*; In *Chalke*; In *Lime*; Couered ouer with *Onions*; Couered ouer with *Crabs*; Closed vp in *Wax*; Shut in a *Box*, &c. There was also an *Apple* hanged vp in *Smoake*: Of all which the *Experiments* sorted in this Manner.

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After a Moneths Space, the *Apple* Enclosed in *Wax*, was as Greene and Fresh as at the first Putting in, & the *Kernels* continued White. The Cause is, for that all *Exclusion* of *Open Aire* (which is euer Predatory) maintaineth the Body in his first Freshnesse, and Moisture: But the In-

conuenience



conuenience is, that it tasteth a little of the *Wax*: Which I suppose, in a *Pomgranate*, or some such thick-coated *Fruit*, it would not doe.

The *Apple* Hanged in the *Smoake*, turned like an Old Mellow *Apple*, Wrinkled, Dry, Soft, Sweet, Yellow within. The *Cause* is, for that such a degree of *Heat*, which doth neither Melt, nor Scorch, (For we see that in a great *Heat*, a *Roast Apple* Softneth and Melteth; And *Pigs feet*, made of Quarters of *Wardens*, scorch and haue a Skin of Cole) doth Mellow, and not Adure: The *Smoake* also maketh the *Apple* (as it were) sprinkled with *Soot*, which helpeth to *Mature*. We see that in *Drying* of *Peares*, and *Prunes*, in the *Ouen*, and Remouing of them often as they begin to Sweat, there is a like Operation; But that is with a farre more Intense degree of *Heat*.

The *Apples* couered in the *Lime* and *Ashes*, were well *Matured*; As appeared both in their *Yellowness* and *Sweetness*. The *Cause* is, for that that Degree of *Heat* which is in *Lime*, and *Ashes* (being a Smothering *Heat*) is of all the rest most Proper; for it doth neither Liquefie, nor Arefie; And that is true *Maturation*. Note that the Taste of those *Apples* was good; And therefore it is the *Experiment* fittest for Use.

The *Apples*, Couered with *Crabs*, and *Onions*, were likewise well *Matured*. The *Cause* is, not any *Heat*; But for that the *Crabs* and the *Onions* draw forth the *Spirits* of the *Apple*, and spread them equally thorowout the *Body*; which taketh away Hardness. So we see one *Apple* ripeneth against another. And therefore in making of *Cider*, they turne the *Apples* first vpon a heape. So one *Cluster* of *Grapes*, that toucheth another whilest it groweth, ripeneth faster; *Botrus contra Botrum citius maturescit*.

The *Apples* in *Hay*, and the *Straw*, ripened apparantly, though not so much as the Other; But the *Apple* in the *Straw* more. The *Cause* is, for that the *Hay* and *Straw* haue a very low degree of *Heat*, but yet Close and Smothering, and which drieth not.

The *Apple* in the *Close Box*, was ripened also: The *Cause* is, for that all Aire, kept close, hath a degree of *Warmth*: As we see in *Wooll*, *Fur*, *Plush*, &c.

Note that all these were Compared with another *Apple*, of the same kinde, that lay of it Selfe: And in Comparison of that, were more Sweet, and more Yellow, and so appeared to be more Ripe.

Take an *Apple*, or *Peare*, or other like *Fruit*, and Rowle it vpon a Table hard: We see in Common Experience, that the *Rowling* doth Soften and Sweeten the *Fruit* presently; Which is Nothing but the *Smooth Distribution* of the *Spirits* into the Parts: For the *Vnequall Distribution* of the *Spirits* maketh the *Harrishness*: But this Hard *Rowling* is betweene *Concoction*, and a *Simple Maturation*; Therefore, if you should Rowle them but gently, perhaps twice a day; And continue it some seuen daies, it is like they would *mature* more finely, and like vnto the *Naturall Maturation*.

Take an *Apple*, and cut out a Peece of the Top, and couer it, to see whether that *Solution of Continuity* will not hasten a *Maturation*: We see



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Solitary tou-  
ching the Ma-  
king of Gold.

that where a *Wasse*, or a *Flie*, or a *Worme* hath bitten, in a *Grape* or any *Fruit*, it will sweeten hastily.

Take an *Apple*, &c. and pricke it with a *Pinne* full of *Holes*, not deepe, and smeare it a little with *Sacke*, or *Cinnamon Water*, or *Spirit of Wine*, every day for ten daies, to see if the *Virtuall Heat* of the *Wine*, or *Strong Waters*, will not *Mature* it.

In these *Trialls* also, as was used in the first, set another of the same *Fruits* by, to Compare them: And try them, by their *Yellownesse*, and by their *Sweetnesse*.

The World hath beene much abused by the Opinion of *Making of Gold*: The *Worke* it selfe I iudge to be possible; But the *Meanes* (hitherto propounded) to effect it, are, in the *Practise*, full of *Errour* and *Imposture*; And in the *Theory*, full of *unsound Imaginations*. For to say, that *Nature* hath an *Intention* to make all *Metals Gold*; And that, if she were deliuered from *Impediments*, shee would performe her owne *Worke*; And that, if the *Crudities*, *Impurities*, and *Leprosities* of *Metals* were cured, they would become *Gold*; And that a little *Quantity* of the *Medicine*, in the *Worke* of *Proiection*, will turne a *Sea* of the *Baser Metall* into *Gold*, by *Multipling*: All these are but *dreames*: And so are many other *Grounds* of *Alchymy*. And to helpe the Matter, the *Alchymists* call in likewise many *Vanities*, out of *Astrologie*; *Naturall Magicke*; *Superstitious Interpretations* of *Scriptures*; *Auricular Traditions*; *Faigned Testimonies* of *Ancient Authors*; And the like. It is true, on the other side, they haue brought to light not a few profitable *Experiments*, and thereby made the World some amends. But we, when we shall come to handle the *Version* and *Transmutation* of *Bodies*; And the *Experiments* concerning *Metalls*, and *Mineralls*; will lay open the true *Waies* and *Passages* of *Nature*, which may leade to this great *Effect*. And we commend the wit of the *Chineses*, who despair of *Making of Gold*, but are Mad vpon the *Making of Siluer*: For certaine it is, that it is more difficult to make *Gold*, (which is the most *Pondrous*, and *Materiate* amongst *Metals*) of other *Metals*, lesse *Ponderous*, and lesse *Materiate*; than (*via versa*) to make *Siluer* of *Lead*, or *Quick-Siluer*; Both which are more *Ponderous* than *Siluer*; So that they need



ned rather a further Degree of *Fixation*, than any *Condensation*. In the meane time, by Occasion of Handling the *Axiomes* touching *Maturation*, we will direct a *Triall* touching the *Maturing* of *Metalls*, and thereby Turning some of them into *Gold*: For we conceiue indeed, that a perfect good *Concoction*, or *Disgestion*, or *Maturation* of some *Metalls*, will produce *Gold*. And here we call to minde, that we knew a *Dutch-man*, that had wrought himselfe into the beleefe of a great Person, by vndertaking that hee could make *Gold*: whose discourse was, that *Gold* might be made; But that the *Alchymists* Ouer-fired the Worke: For (he said) the *Making* of *Gold* did require a very temperate *Heat*, as being in *Nature* a Subterrany work, where little *Heat* commeth; But yet more to the *Making* of *Gold*, than of any other *Metall*; And therefore that he would doe it with a great Lampe, that should carry a Temperate and Equall *Heat*: And that it was the Worke of many Moneths. The Deuice of the Lampe was folly; But the Ouer-firing now vsed; And the Equall Heat to be required; And the Making it a Worke of some good Time; are no ill Discourses.

Wee resort therefore to our *Axiomes* of *Maturation*, in Effect touched before. The first is, that there be used a *Temperate Heat*; For they are euer *Temperate Heats* that *Disgest*, and *Mature*: Wherein we meane *Temperate*, according to the *Nature* of the *Subiect*; For that may be *Temperate* to *Fruits*, and *Liquors*, which will not worke at all vpon *Metalls*. The Second is, that the *Spirits* of the *Metall* be quickened, and the *Tangible Parts* opened: For without those two Operations, the *Spirit* of the *Metall*, wrought vpon, will not be able to disgest the Parts. The Third is, that the *Spirits* doe spread themselves *Euen*, and moue not *Subsultorily*; For that will make the Parts Close, and Pliant. And this requireth a *Heat*, that doth not rise and fall, but continue as *Equall* as may be. The Fourth is, that no Part of the *Spirit* be emitted, but detained: For if there be *Emission* of *Spirit*, the Bodie of the *Metall* will be Hard, and Churlish. And this will be performed, partly by the Temper of the Fire; And partly by the closenesse of the Vessell. The Fifth



Fifth is, that there be *Choyce made of the likeliest and best Prepared Metall, for the Version*: For that will facilitate the Worke. The Sixth is, that you giue *Time enough for the Worke*: Not to prolong Hopes (as the Alchymists doe;) but indeed to giue *Nature* a conuenient Space to worke in. These Principles are most certaine, and true; Wee will now deriue a direction of *Triall* out of them; Which may (perhaps) by further Meditation, be improved.

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Let there be a *Small Furnace* made, of a *Temperate Heat*; Let the *Heat* bee such, as may keepe the *Metall perpetually Moulten*, and no more; For that aboue all importeth to the *Worke*. For the *Materiall*, take *Siluer*, which is the *Metall* that in *Nature* Symbolizeth most with *Gold*; Put in also, with the *Siluer*, a *Tenth Part of Quick-siluer*, and a *Twelfth Part of Nitre*, by weight; Both these to quicken and open the *Body of the Metall*: And so let the *Worke* be continued by the *Space of Six Moneths*, at the least. I wish also, that there be, at some times, an *Iniection* of some *Oyled Substance*; Such as they vse in the *Recouering of Gold*: which by *Vexing with Separations* hath beene made *Churlish*: And this is, to lay the *Parts* more *Close* and *Smooth*, which is the *Maine Worke*. For *Gold* (as we see) is the *Closet* (and therefore the *Heauiest*) of *Metalls*: And is likewise the most *Flexible*, and *Tensible*. Note, that to thinke to make *Gold* of *Quick-siluer*, Because it is the *heaviest*, is a *Thing* not to be hoped; For *Quick-siluer* will not endure the *Mannage of the Fire*. Next to *Siluer*, I thinke *Copper* were fittest to be the *Materiall*.

Experiment  
Solitary touching the  
Nature of Gold.

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**G**old hath these *Natures*: *Greatnesse of Weight*; *Closetnesse of Parts*; *Fixation*; *Pliantnesse*, or *Softnesse*; *Immunity from Rust*; *Colour* or *Tincture of Yellow*. Therefore the *Sure Way*, (though most about,) to make *Gold*, is to know the *Causes* of the *Seuerall Natures* before rehearsed, and the *Axiomes* concerning the same. For if a *Man* can make a *Metall*, that hath all these *Properties*, Let *Men* dispute, whether it be *Gold*, or no?

Experiments  
in Confort,  
touching the  
Enducing and  
Accelerating of  
Putrefaction.

The *Enducing* and *Accelerating* of *Putrefaction*, is a *Subiect* of a very *Vniuersall Enquiry*: For *Corruption* is a *Reciprocall* to *Generation*: And they *Two*, are as *Natures two Termes* or *Bundaries*; And the *Guides* to *Life* and *Death*. *Putrefaction* is the *Worke* of the *Spirits of Bodies*, which euer are *Vnquiet* to *Get forth*, and *Congregate* with the *Aire*, and to enioy the *Sun-beames*. The *Getting forth*, or *Spreading* of the *Spirits*, (which is a *Degree of Getting forth*,) hath *five Differing Operations*. If

the



the *Spirits* be detained within the Body, and moue more violently, there followeth *Colliquation*; As in *Metalls*, &c. If more Mildely, there followeth *Disgestion*, or *Maturation*; As in *Drinckes*, and *Fruits*. If the *Spirits* be not meereley Detained, but Protrude a little, and that Motion be Confused, and Inordinate, there followeth *Putrefaction*; Which euer dissolueth the Consistence of the Body into much Inequality; As in *Flesh*, *Rotten Fruits*, *Shining Wood*, &c. And also in the *Rust* of *Metalls*. But if that Motion be in a certaine Order, there followeth *Viuiification*, and *Figuration*; As both in *Liuing Creatures* bred of *Putrefaction*, and in *Liuing Creatures Perfect*. But if the *Spirits* issue out of the Body, there followeth *Desiccation*, *Induration*, *Consumption*, &c. As in *Bricke*, *Euaporation* of *Bodies Liquid*, &c.

The *Meanes* to *Enduce* and *Accelerate Putrefaction*, are; First by *Adding some Crude or Watry Moisture*; As in *Wetting* of any *Flesh*, *Fruit*, *Wood*, with *Water*, &c. For contrariwise *Vacuous* and *Oily Substances* preserve.

The Second is by *Inuitation* or *Excitation*; As when a *Rotten Apple* lyeth close to another *Apple* that is *Sound*: Or when *Dung* (which is a Substance already *Putrified*) is added to other *Bodies*. And this is also notably seene in *Church-yards*, where they bury much; Where the Earth will consume the *Corps*, in farre shorter time, than other Earth will.

The Third is, by *Clofenesse*, and *Stopping*, which detaineth the *Spirits*, in *Prison*, more than they would; And thereby irritateth them to seeke Issue; As in *Corne*, and *Cloaths*, which wax *Musty*; and therefore *Open Aire* (which they call *Aer persflabilis*) doth preserve: and this doth appeare more Euidently in *Agnes*, which come (most of them,) of *Obstructions*, and *Penning* the *Humours*, which thereupon *Putrifie*.

The Fourth is, by *Solution of Continuities*; As we see an *Apple* will rot sooner, if it be *Cut* or *Pierced*; And so will *Wood*, &c. And so the *Flesh* of *Creatures* aliue, where they haue receiued any *Wound*.

The Fifth is, either by the *Exhaling*, or by the *Drining back* of the *Principall Spirits*, which preserve the Consistence of the *Body*; So that when their *Gouernment* is *Dissolued*, euery *Part* returneth to his *Nature*, or *Homogeny*. And this appeareth in *Vrine*, and *Bloud*, when they coole, and thereby breake; It appeareth also in the *Gangrene*, or *Mortification* of *Flesh*, either by *Opiates*, or by *Intense Colds*. I conceiue also the same Effect is in *Pestilences*, for that the *Malignitie* of the *Infecting Vapour*, daunceth the *Principall Spirits*, and maketh them fly, and leaue their *Regiments*; And then the *Humours*, *Flesh*, and *Secondary Spirits*, doe dissolve, and breake, as in an *Anarchy*.

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The Sixth is, when a *Foraine Spirit*, Stronger and more Eager than the *Spirit of the Body*, entreth the Body; As in the Stinging of Serpents. And this is the Cause (generally) that vpon all *Poysons* followeth *Swelling*: And we see *Swelling* followeth also, when the *Spirits* of the Body it selfe, Congregate too much; As vpon *Blowes*, and *Bruises*; Or when they are *Pent in too much*, as in *Swelling* vpon *Cold*. And we see also, that the *Spirits* comming of *Putrefaction* of *Humours* in *Agnes*, &c. which may be counted as *Foraine Spirits*, though they be bred within the Body, doe Extinguish and Suffocate the *Naturall Spirits*, and *Heat*.

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The Seuenth is, by such a *Weake Degree of Heat*, as setteth the *Spirits* in a little Motion, but is not able, either to digest the Parts, or to Issue the *Spirits*; As is seene in *Flesh* kept in a *Roome* that is not *Coole*: Whereas in a *Coole* and *Wet Larder* it will keepe longer. And we see, that *Vinification* (whereof *Putrefaction* is the *Bastard Brother*,) is effected by such *Soft Heats*; As the *Hatching* of *Egges*; The *Heat* of the *Wombe*, &c.

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The Eight is, by the *Releasing of the Spirits*; which before were close kept by the *Solidnesse* of their *Couerture*, and thereby their *Appetite* of *Issuing* checked; As in the *Artificiall Rusts* induced by strong *Waters*, in *Iron*, *Lead*, &c. And therefore *Wetting* hasteneth *Rust*, or *Putrefaction* of any thing, because it softeneth the *Crust*, for the *Spirits* to come forth.

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The Ninth is, by the *Entercchange of Heat and Cold*, or *Wet and drie*; As we see in the *Mouldring* of *Earth* in *Frosts*, and *Sunne*; And in the more hastie *Rotting* of *Wood*, that is sometimes wet, sometimes drie.

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The tenth is, by *Time*, and the *Worke and Procedure of the Spirits themselves*, which cannot keepe their *Station*; Especially if they be left to themselves; And there be not *Agitation* or *Locall Motion*. As we see in *Corne* not stirred; And mens *Bodies* not exercised.

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All *Moulds* are *Inceptions of Putrefaction*; As the *Moulds* of *Pyes*, and *Flesh*; the *Moulds* of *Orenge*s, and *Limon*s; which *Moulds* afterwards turne into *Wormes*, or more odious *Putrefactions*: And therefore (commonly) proue to be of ill *Odour*. And if the *Body* be *Liquid*, and not apt to *Putrifie* totally, it will cast vp a *Mother* in the *Top*; As the *Mothers* of *Distilled Waters*.

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*Mosse* is a *Kinde of Mould*, of the *Earth*, and *Trees*. But it may be better sorted as a *Rudiment of Germination*; To which we referre it.

Experiments  
in Conser-  
uation tou-  
ching Prohi-  
biting and Pre-  
uenting Putrefac-  
tion.

It is an *Enquiry* of *Excellent vse*, to *Enquire of the Meanes* of *Preuenting* or *Staying Putrefaction*; For therein consisteth the *Meanes* of *Conseruation* of *Bodies*; For *Bodies* haue two *Kindes* of *Diffolutions*; The one by *Consumption*, and *Desiccation*; The other by *Putrefaction*. But as for the *Putrefactions* of



of the *Bodies* of Men, and *Living Creatures*, (as in Agues, Wormes, Consumptions of the Lungs, Impostumes, and Vicers both Inwards and Outwards,) they are a great *Part* of *Physicke*, and *Surgery*: And therefore we will reserve the *Enquiry* of them to the proper Place, where we shall handle *Medicinal Experiments* of all Sorts. Of the rest we will now Enter into an *Enquiry*: wherein much light may be taken, from that which hath beene said, of the *Meanes* to *Enduce* or *Accelerate Putrefaction*: For the Remouing that, which caused *Putrefaction*, doth *Preuent* and *Auoid Putrefaction*.

The First *Meanes* of *Prohibiting* or *Chesking Putrefaction*, is *Cold*: For so we see that Meat and Drinke will last longer, Vnputrified, or Vnsoured, in Winter, than in Summer: And we see that Flowers, and Fruits, put in *Conseruatories* of Snow, keepe fresh. And this worketh by the *Detention* of the *Spirits*, and *Constipation* of the *Tangible Parts*.

The second is *Astriction*: For *Astriction* prohibiteth *Dissolution*: As we see (generally) in *Medicines*, whereof such as are *Astringents* doe inhibit *Putrefaction*: And by the same reason of *Astringencie*, some small Quantitie of Oile of Vitrioll, will keepe Fresh Water long from *Putrefying*. And this *Astriction* is in a Substance that hath a *Virtuall Cold*; And it worketh (partly) by the same *Meanes* that Cold doth.

The Third is, the *Excluding* of the *Aire*; And againe, the *Exposing* to the *Aire*: For these *Contraries*, (as it commeth often to passe,) worke the same Effect, according to the Nature of the Subiect Matter. So we see, that *Beere*, or *Wine*, in Bottles close stopped, last long; That the *Garners* under Ground keepe Corne longer than those aboue Ground; And that *Fruit closed in Wax* keepeth fresh: And likewise *Bodies* put in *Honey*, and *Flower*, keepe more fresh: And *Liquors*, *Drinkes*, and *Iuyces*, with a little Oyle cast on the Top, keepe fresh. Contrariwise, we see that *Cloth* and *Apparell*, not *Aired*, doe breed Moathes, and Mould; and the Diuersitie is, that in *Bodies* that need *Detention* of *Spirits*, the *Exclusion* of the *Aire* doth good; As in *Drinks*, and *Corne*: But in *Bodies* that need *Emission* of *Spirits*, to discharge some of the Superfluous Moisture, it doth hurt, for they requite *Airing*.

The Fourth is *Motion*, and *Stirring*; For *Putrefaction* askest *Rest*; For the Subtill *Motion*, which *Putrefaction* requireth, is disturbed by any *Agitation*; And all *Locall Motion* keepeth *Bodies* Integrall, and their Parts together; As we see that Turning ouer of Corne in a Garner; Or Letting it runne like an Houre-glasse, from an vpper Roome into a Lower, doth keepe it Sweet: And Running Waters putrefie not: And in Mens *Bodies*, Exercise hindereth *Putrefaction*; And contrariwise *Rest*, and Want of *Motion*, or Stoppings, (whereby the Runne of Humours, or the Motion of Perspiration, is stayed,) further *Putrefaction*; As we partly touched a little before.

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The Fifth is, the *Breathing forth of the Aduentitious Moisture in Bodies*; For as *Waiting* doth hasten *Putrefaction*; So *Convenient Drying*, (whereby the more *Radical Moisture* is onely kept in,) putteth backe *Putrefaction*: So we see that *Herbs*, and *Flowers*, if they be dried in the Shade; Or dried in the hot Sunne, for a small time, keepe best. For the *Emission* of the *Loose* and *Aduentitious Moisture*, doth betray the *Radical Moisture*; And carryeth it out for Company.

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The Sixth is, the *Strengthening of the Spirits of Bodies*; For as a *Great Heat* keepeth Bodies from *Putrefaction*; But a *Tepide Heat* enclineth them to *Putrefaction*: So a *Strong Spirit* likewise preferueth, and a *Weake* or *Faint Spirit* disposeth to *Corruption*. So we finde that *Salt-water* corrupteth not so soone as *Fresh*: And *Saling* of *Oysters*, and *Powdring* of *Meat*, keepeth them from *Putrefaction*. It would be tried also, whether *Chalke* put into *Water*, or *Drinke*, doth not preferue it from *Putrefying*, or speedy *Souring*. So we see that *Strong Beere* will last longer than *Small*; And all Things, that are hot and *Aromaticall*, doe helpe to preferue *Liquors*, or *Powders*, &c. Which they do, as well by *Strengthening the Spirits*, as by *Soaking out the loose Moisture*.

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The Seuen is, *Separation of the Cruder Parts*, and thereby making the *Body more Equall*; for all vnperfect Mixture is apt to *Putrefie*; And *Watry Substances* are more apt to *Putrefie*, than *Oily*. So we see *Distilled Waters* will last longer than *Raw waters*; And things that haue passed the *Fire*, doe last longer, than those that haue not passed the *Fire*; As *Dried Peares*, &c.

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The Eighth is, the *Drawing forth continually of that part, where the Putrefaction beginneth*: Which is (commonly) the *Loose and watry Moisture*; Not onely for the Reason before giuen, that it prouoketh the *Radical Moisture* to come forth with it; But because being detained in the *Body*, the *Putrefaction* taking hold of it, infecteth the rest: As wee see in the *Embalming dead Bodies*: And the same Reason is of *Preseruing Herbs*, or *Fruits*, or *Flowers*, in *Branne*, or *Meale*.

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The Ninth is, the *Commixture of any Thing that is more Oily, or Sweet*: For such *Bodies* are least apt to *Putrefie*, the *Aire* working little vpon them; And they not putrefying preferue the rest. And therefore we see *Syrups*, and *Ointments*, will last longer, than *Iuyces*.

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The Tenth is, the *Commixture of somewhat that is Drie*; For *Putrefaction* beginneth first from the *Spirits*; And then from the *Moisture*: And that that is drie is vnapt to putrefie: And therefore *Smoake* preferueth *Flesh*; As wee see in *Bacon*, and *Neats-Tongues*, and *Martlemas Beefe*, &c.

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The Opinion of some of the *Ancients*, that *Blowne Aires* doe preferue *Bodies*, longer than other *Aires*, seemeth to mee Probable; For that the *Blowne Aires*, being *Ouer-charged* and *Compressed*, will hardly receiue the *Exhaling* of any Thing, but rather repulse it. It was tried in a *Blowne Bladder*, whereinto *Flesh* was put, and likewise a *Flower*, and it sorted not: For *Dry Bladders* will not *Blow*: And *New Bladders* rather



ther further *Putrefaction*: The way were therefore, to blow strongly, with a Paire of Bellows, into a Hoghead, putting into the Hoghead (before) that which you would haue preserued; And in the instant that you withdraw the Bellows, stop the Hole close.

**T**He Experiment of Wood that *Shineth* in the *Dark*, we haue diligently driuen, and pursued: The rather, for that of all Things, that giue Light here below, it is the most Durable; And hath least Apparent Motion. *Fire* and *Flame* are in continuall Expence; *Sugar* shineth onely while it is in Scraping; And *Salt-water* while it is in Dashing; *Glow-wormes* haue their Shining while they liue, or a little after. Onely *Scales of Fishes* (*Putrified*) seeme to be of the same Nature with *Shining Wood*: And it is true, that all *Putrefaction* hath with it an Inward Motion, as well as *Fire*, or *Light*. The *Triall* sorted thus. 1. The *Shining* is in some Peeces more *Bright*, in some more *Dimme*; but the most *Bright* of all doth not attaine to the Light of a *Glow-worme*. 2. The *Woods* that haue beene tried to shine, are chiefly *Sallow* and *Willow*; Also the *Asb*, and *Hassle*; It may be, it holdeth in others. 3. Both *Roots*, and *Bodies* doe shine, but the *Roots* better. 4. The *Colour* of the *Shining Part*, by Day-light, is in some Peeces *White*, in some Peeces inclining to *Red*; Which in the Countrey they call the *White*, and *Red Garves*. 5. The *Part* that *Shineth*, is, (for the most part) somewhat *Soft*, and *Moist* to feele to; But some was found to be *Firme* and *Hard*; So as it might be figured into a *Crosse*, or into *Beads*, &c. But you must not looke to haue an *Image*, or the like, in any thing that is *Lightsome*; For euen a face in *Iron* red Hot will not be seene, the *Light* confounding the small differences of *Lightsome* and *Dirksome*, which shew the figure. 6. There was the *Shining Part* pared off, till you came to that, that did not Shine; But within two *Dies* the *Part Contiguous* beganne also to *Shine*, being laid abroad in the *Dew*; So as it seemeth the *Putrefaction* spreadeth. 7. There was other dead *Wood* of like kinde, that was *Laid abroad*, which *Shined* not at the first; But after a *Nights* lying abroad began to *Shine*. 8. There was other *Wood*, that did *First shine*; And being laid dry in the *House*, within five or six daies, *Lost the Shining*; And laid abroad againe, *Recovered the Shining*. 9. *Shining woods*, being laid in a *Dry Room*, within a *Seuen night*, lost their *Shining*; but being laid in a *Cellar*, or *Danke Room*, kept the *Shining*. 10. The *Bearing of Holes*, in that kinde of *Wood*, and then laying it abroad, seemeth to conduce to make it *Shine*: The *Cause* is, for that all *Solution of Continuity* doth helpe on *Putrefaction*, as was touched before. 11. No *Wood* hath beene yet tried to *Shine*, that was cut *downe alive*, but such as was *Rotted*, both in *Stocke*, and *Root*, while it grew. 12. Part of the *Wood* that *Shined*, was steeped in *Oile*, and retained the *Shining* a *Forthnight*. 13. The like succeeded in some *Steeped in Water*, and much better. 14. How long the *Shining* will continue, if the *Wood* be laid abroad every *Night*, and taken in and *Sprinkled* with *Water* in the *Day*, is not yet tried. 15. *Triall* was made

Experiment  
Solitary touch-  
ing Wood  
Shining in the  
Dark.

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Experiment  
Solitary touch-  
ing Wood  
Shining in the  
Dark.

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made of laying it abroad in Brasie weather, which hurt it not, 16. There was a great Piece of a *Rest* which did shine, and the *Shining Part* was Cut off, till no more Shined: Yet after two Nights, though it were kept in a dry Roome, it got a *Shining* Head, as well as the whole.

Experiment  
Solitary touching the  
Acceleration of Birth.

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**T**He Bringing forth of *Lining* Creatures may be accelerated in two Respects: The one, if the *Embryon* ripeneth and perfecteth sooner: The other, if there be some Cause from the *Mothers Body*, of *Expulsion* or Putting it down: whereof the Former is good, and argueth Strength; The Latter is ill, and cometh by Accident or Disease. And therefore the Ancient Observation is true, that the *Childe borne in the seventh Moneth*, doth commonly well; But *Borne in the Eighth Moneth*, doth (for the most part) die. But the Cause assigned is Fabulous; Which is, that in the Eighth Moneth, should be the Returne of the Reigne, of the Planet *Saturne*; which (as they say) is a Planet Maligne; whereas in the Seventh is the Reigne of the *Mars*, which is a Planet Propitious. But the true Cause is, for that where there is so great a Preuention of the Ordinary time, it is the *lustinesse* of the *Childe*; But when it is lesse, it is some *Indisposition* of the *Mother*.

Experiment  
Solitary touching the  
Acceleration of  
growth and  
Stature.

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**T**O Accelerate Growth or Stature, it must proceed; Either from the Plenty of the *Nourishment*; Or from the Nature of the *Nourishment*; Or from the Quickning and Exciting of the *Naturall Heat*. For the first, Excessse of *Nourishment* is hurtfull; For it maketh the *Childe* Corpulent; And Growing in Breadth, rather than in Height. And you may take an Experiment from *Plants*, which, if they spread much, are seldome tall. As for the Nature of the *Nourishment*; First, it may not be too Dry; And therefore Children in Dayrie Countries doe wax more tall, than where they feed more vpon Bread, and Flesh. There is also a receiued Tale, That Boyling of *Durie Rots* in *Milke* (which it is certaine are great Dietts) will make *Dogs* little. But so much is true, that an *Over-drie Nourishment* in Childhood putteth backe Stature. Secondly, the *Nourishment* must be of an *opening Nature*; For that Attenuateth the Iuice, and furthereth the Motion of the Spirits, vpwards. Neither is it without cause; that *Xenophon*, in the *Nouriture* of the *Persian Children*, doth so much commend their Feeding vpon *Candamon*; which (hee saith) maketh them grow better, and be of a more Active Habit. *Candamon* is in *Latine Nasturtium*; And with vs *Water Cresses*. Which, it is certaine, is an Herbe, that whilst it is young, is Friendly to Life. As for the Quickning of *Naturall Heat*, it must be done chiefly with Exercise; And therefore (as doth) much Going to Schoole, where they sit so much, hindreth the Growth of *Children*; whereas Country People, that goe not to Schoole, are commonly of better Stature. And againe Men must beware, how they giue *Children*, any thing that is Cold in Operation; For such *Cold Springs* doth hinder both *Life*, and *Stature*. This hath bene noticed, that a *Whelp*, that hath bene fed with *Milke*, hath bene

come



come very little, but extreme lively: For the *Spirit* of *Nitre* is *Cold*. And though it be an Excellent Medicine, in Strength of yeeres, for Prolongation of Life; yet it is, in Children and young Creatures, an Enemy to Growth: And all for the same Reason; For *Heat* is requisite to Growth: But after a Man is come to his Middle Age, *Heat* consumeth the Spirits; which the Coldnesse of the Spirit of *Nitre* doth helpe to condense, and correct.

There be two Great Families of Things; You may terme them by severall Names; *Sulphureous* and *Mercuriall*, which are the *Chymists* Words: (For as for their *Sal*, which is their third Principle, it is a Compound of the other two;) *Inflammable* and *Not Inflammable*; *Mature* and *Crude*; *Oily* and *Watry*. For we see that in *Subterraneities* there are, as the *Fathers* of their Tribes, *Brimstone* and *Mercury*: In *Vegetables*, and *Living Creatures*, there is *Water* and *Oile*: In the *Inferiour Order* of *Pneumatics* there is *Aire* and *Flame*: And in the *Superiour*, there is the *Body* of the *Starre*, and the *Pure Sky*. And these Paires, though they be vnlike in the Primitive Differences of Matter, yet they seeme to haue many Consents: For *Mercury* and *Sulphure* are principall Materials of *Metalls*; *Water* and *Oyle*, are principall Materials of *Vegetables* and *Animals*; And seeme to differ but in *Maturation*, or *Concoction*: *Flame* (in *Vulgar Opinion*) is but *Aire Incensed*; And they both haue Quicknesse of Motion, and Facility of Cession, much alike: And the *Interstellar Skie*, (though the Opinion be vaine, that the *Starre* is the *Denser Part* of his *Orbe*) hath notwithstanding so much Affinity with the *Star*, that there is a Rotation of that, as well as of the *Starre*. Therefore, it is one of the greatest *Magnalia Naturæ*, to turne *Water*, or *Watry Iuyce*, into *Oile* or *Oily Iuyce*: Greater in Nature, than to turne *Siluer*, or *Quick-Siluer*, into *Gold*.

The Instances we haue, wherein *Crude* and *Watry Substance* turneth into *Fat* and *Oily*, are of foure kinds. First in the *Mixture* of *Earth* and *Water*; which mingled by the helpe of the *Sunne*, gather a *Nitrous Fatnesse*, more than either of them haue severally; As we see, in that they put forth *Plants*, which need both Iuyces.

The Second is in the *Assimilation* of *Nourishment*, made in the *Bodies* of *Plants*, and *Living Creatures*; Whereof *Plants* turne the Iuyce of meere *Water* and *Earth*, into a great deale of *Oily Matter*: *Living Creatures*,

Experiments  
in Consort,  
touching Sul-  
phur and Mer-  
cury, two of Pa-  
racelsus Princi-  
ples.

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tures, though much of their *Fat* and *Flesh*, are out of *Oily Aliments*, (as *Meat* and *Bread*) yet they Assimilate also in a Measure their *Drinke* of *Water*, &c. But these two *Vaies* of *Versification* of *Water* into *Oile*, (namely by *Mixture*, and by *Assimilation*) are by many *Passages*, and *Percolations*, and by long *Continuance* of soft *Heats*, and by *Circuits* of *Time*.

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The third is in the *Inception* of *Putrefaction*; As in *Water Corrupted*; And the *Mothers* of *Waters Distilled*; Both which haue a kinde of *Fatnesse* or *Oile*.

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The Fourth is in the *Dulcoration* of some *Metals*; As *Saccharum Saturni*, &c.

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The Intention of *Versification* of *Water* into a more *Oily Substance*, is by *Disgestion*; For *Oile* is almost Nothing else but *Water digested*; And this *Disgestion* is principally by *Heat*; Which *Heat* must be either *Outward*, or *Inward*: Againe, it may be by *Prouocation*, or *Excitation*; Which is caused by the *Mingling* of *Bodies* already *Oily* or *Disgested*; For they will somewhat *Communicate* their *Nature* with the rest. *Disgestion* also is strongly effected by direct *Assimilation*, of *Bodies Crude* into *Bodies Disgested*; As in *Plants*, and *Living Creatures*, whose *Nourishment* is far more *Crude* than their *Bodies*: But this *Disgestion* is by a great *Compasse*, as hath beene said. As for the more full handling of these two *Principles*, whereof this is but a *Taste*; (the *Enquiry* of which is one of the *Profoundest Enquiries* of *Nature*) We leaue it to the *Title* of *Versification* of *Bodies*; And likewise to the *Title* of the *First Congregations* of *Matter*; Which like a *Generall Assembly* of *Estates*, doth giue *Law* to all *Bodies*.

Experiment  
Solitary touching  
chameleons.

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**A** *Chameleon* is a *Creature* about the *Bignesse* of an *Ordinary Lizard*: His *Head* vnproportionably big; His *Eyes* great: He moueth his *Head* without the writhing of his *Necke* (which is inflexible) as a *Hogge* doth: His *Backe* crooked; His *Skin* spotted with little *Tumours*, lesse *Eminent* neerer the *Belly*; his *Taile* slender, and long: On each *Foot* he hath five *Fingers*; three on the *Outside*, and two on the *Inside*; His *Tongue* of a maruellous *Length* in respect of his *Body*, & hollow at the end; Which he will launch out to prey vpon *Flies*. Of *Colour* *Greene*, and of a dusky *Yellow*, brighter and whiter towards the *Belly*; Yet spotted with *Blew*, *White*, and *Red*. If hee bee laid vpon *Greene*, the *Greene* predominateth; If vpon *Yellow*, the *Yellow*; not so if he be laid vpon *Blew*, or *Red*, or *White*; Onely the *Greene Spots* receiue a more *Orient Lustre*: Laid vpon *Blacke*, he looketh all *Blacke*, though not without a *Mixture* of *Greene*. He feedeth not onely vpon *Aire* (though that be his principall *Sustenance*;) For sometimes hee taketh *Flies*, as was said; Yet some that haue kept *Chameleons* a whole yeere together, could neuer perceiue that euer they fed vpon any *Thing* else but *Aire*; And might obserue their *Bellies* to swell after they had exhausted the *Aire*, and closed their *Iawes*; Which they open commonly



monly against the Rayes of the Sunne. They haue a foolish Tradition in *Magicke*, that if a *Chameleon* be burnt vpon the Top of a House, it will raise a Tempest; Supposing (according to their vaine Dreames of *Sympathies*) because he nourisheth with Aire, his Body should haue great vertue to make Impression vpon the Aire.

**I**T is reported by one of the *Ancients*, that in Part of *Media*, there are *Eruptions* of *Flames* out of *Plaines*; And that those *Flames* are cleere, and cast not forth such Smoake, and Ashes, and Pumice, as *Mountain* *Flames* doe. The Reason (no doubt) is, because the *Flame* is not pent, as it is in *Mountaines*, and *Earth-quakes* which cast *Flame*. There be also some *Blinde Fires*, vnder *Stone*, which flame not out, but *Oile* being powred vpon them, they flame out. The Cause whereof is, for that it seemeth, the *Fire* is so choaked, as not able to remoue the *Stone*, it is *Heat*, rather than *Flame*; Which neuerthelesse is sufficient to Enflame the *Oile*.

Experiment  
Solitary touching  
Subterranean  
Fires.

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**I**T is reported, that in some *Lakes*, the *Water* is so *Nitrous*, as if Foule *Cloaths* be put into it, it scoureth them of it selfe: And if they stay any whit long, they moulder away. And the Scouring Vertue of *Nitre* is the more to be noted, because it is a *Body Cold*; And we see *Warne Water* scoureth better than *Cold*. But the Cause is, for that it hath a Subtill Spirit, which seuereth and diuideth any thing that is foule, and Viscous, and sticketh vpon a *Body*.

Experiment  
Solitary touching  
*Nitre*.

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**T**AKE a *Bladder*, the greatest you can get; Fill it full of *Wind*, and tye it about the Necke with a *Silke* thred waxed; And vpon that put likewise *Wax* very close; So that when the Necke of the *Bladder* drieth, no *Aire* may possibly get in, nor out. Then bury it three or foure foot vnder the *Earth*, in a *Vault*, or in a *Conservatory* of *Snow*, the *Snow* being made hollow about the *Bladder*; And after some Fortnights distance, see whether the *Bladder* be shrunk: For if it be, then it is plaine, that the *Coldnesse* of the *Earth*, or *Snow*, hath Condensed the *Aire*, and brought it a Degree neerer to *Water*: Which is an *Experiment* of great Consequence.

Experiment  
Solitary touching  
Congealing of  
*Aire*.

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**I**T is a Report of some good credit, that in *Deepe Canes*, there are *Penfile Crystall*, and *Degrees* of *Crystall* that drop from aboue; And in some other, (though more rarely) that rise from below. Which though it be chiefly the Worke of *Cold*, yet it may bee, that *Water*, that passeth thorow the *Earth*, gathereth a Nature more clammy, and fitter to Congeale, and become Solid; than *Water* of it selfe. Therefore Triall would be made, to lay a Heape of *Earth*, in great Frosts, vpon a Hollow Vessel, putting a Canuase betweene, that it falleth not in: And powre *Water* vpon it, in such Quantity, as will be sure to soake thorow; And see whether it will not make an harder Ice in the bottome of the Vessel,

Experiment  
Solitary touching  
Congealing of  
*Water* into  
*Crystall*.

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and lesse apt to dissolve, than ordinarily. I suppose also, that if you make the Earth narrower at the bottome, than at the Top, in fashion of a Sugar Loafe Reversed, it will helpe the Experiment. For it will make the Ice, where it Issueth, lesse in Bulke; And euermore Smalnesse of Quantity is a Helpe to *Version*.

Experiment  
Solitary tou-  
ching Preser-  
uing of Rose-  
leaves, both in  
Colour & Smell.

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**T**Ake *Damask Roses*, and pull them; Then dry them vpon the Top of an House, vpon a Lead or Tarras, in the hot Sunne, in a cleere day, betweene the Houres (onely) of twelue and two; or thereabouts. Then put them into a Sweet Dry Earthen Bottle, or a Glasse, with narrow Mouthes, stuffing them close together, but without Bruising: Stop the Bottle, or Glasse close, and these *Roses* will retaine, not onely their Smell! Perfect, but their Colour fresh, for a yeere at least. Note, that Nothing doth so much destroy any Plant, or other Body, either by *Putrefaction*, or *Arefaction*, as the *Aduentitious Moisture*, which hangeth loose in the Body, if it be not drawne out. For it betrayeth and rolleth forth the *Innate* and *Radicall Moisture*, along with it, when it selfe goeth forth. And therefore in *Living Creatures*, Moderate Sweat doth preserve the Iuyce of the Body. Note that these *Roses*, when you take them from the *Drying*, haue little or no Smell; So that the Smell is a Second Smell, that issueth out of the *Flower* afterwards.

Experiments  
in Consort  
touching the  
Continuance of  
Flame.

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**T**He Continuance of Flame, according vnto the diuersity of the Body Enflamed, & other Circumstances, is worthy the Enquiry; Chiefly, for that though Flame be (almost) of a Momentary Lasting, yet it receiue the More, and the Lesse: we will first therefore speake (at large) of Bodies Enflamed, wholly, and Immediately, without any *Wieke* to helpe the *Inflammation*. A Spoonfull of Spirit of Wine, a little heated, was taken, and it burnt as long as came to 116. Pulses. The same Quantity of Spirit of Wine, Mixed with the Sixth Part of a Spoonfull of Nitre, burnt but to the space of 94. Pulses. Mixed with the like Quantity of Bay-salt, 83. Pulses. Mixed with the like Quantity of Gunpowder, which dissolved into a Black water, 110. Pulses. A Cube, or Pellet of Tellow Wax, was taken, as much as halfe the Spirit of Wine, and set in the Middlest, and it burnt onely to the space of 87. Pulses. Mixed with the Sixth Part of a spoonfull of Milke, it burnt to the space of 100. Pulses; And the Milke was crudled. Mixed with the Sixth Part of a spoonfull of Water, it burnt to the space of 86. Pulses; With an Equall Quantity of Water, onely to the space of 4. Pulses. A small Pebble was laid in the Middlest; and the Spirit of Wine burnt to the space of 94. Pulses. A Peece of Wood, of the bignesse of an Arrow, and about a Fingers length, was set vp in the Middlest, and the Spirit of Wine burnt to the space of 94. Pulses. So that the Spirit of Wine Simple, endured the longest; And the Spirit of Wine with the Bay-salt, and the Equall Quantity of Water, were the shortest.

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Consider well, whether the more speedy Going forth of the flame, be caused,



caused, by the *Greaser Vigour* of the *Flame* in *Burning*; Or by the *Resistance* of the *Body mixed*, and the *Aversion* thereof to take *Flame*: Which will appeare by the *Quantity* of the *Spirit of Wine*, that remaineth after the *Going out* of the *Flame*. And it seemeth clearly to be the latter; For that the *Mixture* of Things least apt to burne, is the *Speediest* in going out. And note, by the way, that *Spirit of Wine* burned, till it goe out of it selfe, will burne no more; And tasteth nothing so hot in the Mouth, as it did; No nor yet fowre, (as if it were a degree towards *Vineger*,) which *Burnt Wine* doth; but flat and dead.

Note, that in the *Experiment* of *Wax* aforesaid, the *Wax* dissolved in the burning, and yet did not incorporate it selfe, with the *Spirit of Wine*, to produce one *Flame*; but wheresoeuer the *Wax* floated, the *Flame* forsooke it, till at last it spread all ouer, and put the *Flame* quite out.

The *Experiments* of the *Mixtures* of the *Spirit of Wine* enflamed, are Things of *Discouerie*, and not of *Vse*: But now we will speake of the *Continuance* of *Flames*, such as are vsed for *Candles*, *Lampes*, or *Tapers*; consisting of *Inflammable Matters*, and of a *Wicke* that prouoketh *Inflammation*. And this importeth not only *Discouery*, but also *Vse* and *Profit*; For it is a great *Sauing*, in all such *Lights*, if they can be made as faire and bright as others, and yet last longer. *Wax Pure* made into a *Candle*, and *Wax Mixed* seuerally into *Candle-stuffe*, with the *Particulars* that follow; (*viz. Water, Aqua-vita, Milke, Bay-salt, Oyle, Butter, Nitre, Brimstone, Saw-dust*,) Euery of these bearing a *Sixth Part* to the *Wax*; And euery of these *Candles mixed*, being of the same *Weight* and *Wicke* with the *Wax Pure*, proued thus in the *Burning*, and *Lasting*. The *Swiftest* in *Consuming* was that with *Saw-dust*; Which first burned faire, till some part of the *Candle* was consumed, and the *Dust* gathered about the *Snafte*; But then it made the *Snafte* bigge, and long, and to burne duskishly, and the *Candle* wasted in halfe the time of the *Wax Pure*. The next in *Swiftnesse*, were the *Oyle*, and *Butter*, which consumed, by a *Fifth part*, swifter than the *Pure Wax*. Then followed in *Swiftnesse* the *Cleare Wax* it selfe. Then the *Bay-Salt*, which lasted about an *Eighth part* longer than the *Cleare Wax*. Then followed the *Aqua-vita*, which lasted about a *Fifth part* longer than the *Cleare Wax*. Then followed the *Milke*, and *Water*, with little difference from the *Aqua-vita*, but the *Water* slowest. And in these foure last, the *Wicke* would spit forth little *Sparkes*. For the *Nitre*, it would not hold lighted aboue some *Twelue Pulses*; But all the while it would spit out *Portions of Flame*, which afterwards would goe out into a vapour. For the *Brimstone*, it would hold lighted, much about the same time with the *Nitre*; But then after a little while, it would harden and cake about the *Snafte*; So that the *Mixture* of *Bay-Salt* with *Wax*, will win an *Eighth part* of the time of lasting, and the *Water* a *Fifth*.

After the *Seuerall Materialls* were tried, *Triall* was likewise made of *seuerall Wickes*; As of *Ordinary Cotton*; *Sowing Thred*; *Rush*; *Silke*; *Straw*; and *Wood*. The *Silke*, *Straw*, and *Wood*, would flame a little, till they

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they came to the *Wax*, and then goe out: of the Other Three, the *Thred* consumed faster than the *Cotton*, by a Sixth part of Time: The *Cotton*, next: Then the *Rush* consumed slower than the *Cotton*, by at least a third part of time. For the Bignesse of the *Flame*, the *Cotton*, and *Thred*, cast a *Flame* much alike; and the *Rush* much lesse, and dimmer. *Quare*, whether *Wood*, and *Wickes* both, as in *Torches*, consume faster, than the *Wickes Simple*?

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We haue spoken of the Seuerall *Materialls*, and the Seuerall *Wickes*: But to the *lasting* of the *Flame*, it importeth also; Not only what the *Materiall* is, but in the same *Materiall*, whether it be Hard, Soft, Old, New, &c. Good *House-wives*, to make their *Candles* burne the longer, vse to lay them (one by one) in *Bran*, or *Flower*, which make them harder, and so they Consume the slower: In so much, as by this meanes, they will outlast other *Candles*, of the same *Stuffe*, almost Halfe in Halfe. For *Bran* and *Flower* haue a Vertue to Harden: So that both Age, and lying in the *Bran*, doth helpe to the *Lasting*. And we see that *Wax Candles* last longer than *Tallow Candles*, because *Wax* is more firme, and hard.

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The *Lasting* of *Flame* also dependeth vpon the easie *Drawing* of the *Nourishment*; As we see in the *Court* of *England*, there is a Seruice which they call *All-night*; which is (as it were) a great Cake of *Wax*, with the *Wicke* in the Middest; whereby it commeth to passe, that the *Wicke* fetcheth the *Nourishment* further off. We see also that *Lamps* last longer, because the *Vessell* is farre broader, than the Breadth of a *Taper*, or *Candle*.

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Take a *Turretted Lampe* of *Tinne*, made in the forme of a *Squire*; The Heighth of the *Turret* being thrice as much, as the length of the lower part, whereupon the *Lampe* standeth: Make only one Hole in it, at the End of the Returne furthest from the *Turret*. Reuerse it, and fill it full of *Oile*, by that Hole; And then set it vpright againe; And put a *Wicke* in at the Hole; And lighten it: You shall finde that it will burne slow, and a long time. Which is caused, (as was said last before,) for that the *Flame* fetcheth the *Nourishment* a farre off. You shall finde also, that as the *Oile* wasteth, and descendeth, so the Top of the *Turret*, by little and little, filleth with *Aire*; which is caused by the Rarefaction of the *Oile* by the Heat. It were worthy the Obseruation, to make a Hole, in the Top of the *Turret*, and to trie, when the *Oile* is almost consumed, whether the *Aire* made of the *Oile*, if you put to it a *Flame* of a *Candle*, in the letting of it forth, will Enflame. It were good also to haue the *Lampe* made, not of *Tinne*, but of *Glasse*, that you may see how the Vapour, or *Aire* gathereth, by degrees, in the Top.

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A Fourth Point, that importeth the *lasting* of the *Flame*, is the Closeness of the *Aire*, wherein the *Flame* burneth. We see, that if *Wind* bloweth vpon a *Candle*, it wasteth apace. Wee see also, it lasteth longer in a *Lanterne*, than at large. And there are Traditions of *Lampes*, and *Candles*, that haue burnt a very long time, in *Caves*, and *Tombes*.

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A Fifth Point, that importeth the *Lasting* of the *Flame*, is the Nature of



of the *Aire*, where the *Flame* burneth; whether it be Hot or Cold; Moist or Drie. The *Aire*, if it be very *Cold*, irritateth the *Flame*, and maketh it burne more fiercely; (As Fire scorseth in Frosty weather;) And so furthereth the *Consumption*. The *Aire* once heated, (I conceiue) maketh the *Flame* burne more mildly, and so helpeth the *Continuance*. The *Aire*, if it be *Drie*, is indifferent: The *Aire*, if it be *Moist*, doth in a Degree quench the *Flame*: (As we see *Lights* will goe out in the *Damps* of *Mines*;) And howsoeuer maketh it burne more dully: And so helpeth the *Continuance*.

**B**urials in Earth serue for *Preseruation*; And for *Condensation*; And for *Induration* of *Bodies*. And if you intend *Condensation*, or *Induration*, you may bury the *Bodies* so, as *Earth* may touch them: As if you will make *Artificiall Porcellane*, &c. And the like you may doe for *Conseruation*, if the *Bodies* be Hard and Solid, As Clay, Wood, &c. But if you intend *Preseruation* of *Bodies*, more Soft and Tender, then you must doe one of these two: Either you must put them in *Cases*, whereby they may not touch the *Earth*; Or else you must vault the *Earth*, whereby it may hang ouer them, and not touch them; For if the *Earth* touch them, it will doe more hurt, by the Moisture, causing them to putrifie, than good by the virtuall Cold, to conserue them; Except the *Earth* be very Drie, and Sandie.

An *Orange*, *Limon*, and *Apple*, wrapt in a Linnen Cloth, being buried for a Fortnights Space, foure foot deepe within the *Earth*, though it were in a Moist Place, and a Rainie Time, yet came forth, no wayes Mouldie, or Rotten, but were become a little harder than they were; Otherwise fresh in their Colour; But their Iuyce somewhat flatted. But with the *Buriall* of a Fortnight more they became Putrified.

A *Bottle* of *Beere*, buried in like manner, as before, became more liuely, better tasted, and Clearer, than it was. And a *Bottle* of *Wine* in like manner. A *Bottle* of *Vinegar*, so buried, came forth more liuely, and more Odoriferous, smelling almost like a *Violer*. And after the whole Moneths *Buriall*, all the Three came forth, as fresh and liuely, if not better, than before.

It were a profitable *Experiment*, to preserue *Orenges*, *Lemons*, and *Pomgranates*, till Summer; For then their Price will be mightily increased. This may be done, if you put them in a Pot or Vessell, well couered, that the Moisture of the *Earth* come not at them; Or else by putting them in a *Conseruatory* of *Snow*. And generally, whosoever will make *Experiments* of Cold, let him be provided of three Things; A *Conseruatory* of *Snow*; A good large *Vault*, twenty foot at least vnder the Ground; And a Deepe Well.

There hath beene a Tradition, that *Pearle*, and *Corall*, and *Turchois-Stone*, that haue lost their Colours, may be recovered by *Burying* in the *Earth*: Which is a thing of great profit, if it would sort: But vpon Triall of Six Weekes *Buriall*, there followed no Effect. It were good to trie it,

Experiments  
in Consort tou-  
ching Burialls  
or Infusions of  
diuers Bodies in  
Earth.

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in



Experiment  
Solitary tou-  
ching the Af-  
fects in Men  
Bodies from Se-  
uerall Winds.

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Experiment  
Solitary tou-  
ching Winter  
and Summer  
Sickneses.

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Experiment  
Solitary tou-  
ching Pestilen-  
tiall Seasons.

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Experiment  
Solitary tou-  
ching an Error  
received about  
Epidemicall Dis-  
eases.

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Experiment  
Solitary tou-  
ching the Alte-  
ration or of Pre-  
servation of Li-  
quors in Wells,  
or deepe Vaults.

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in a *Deepe Well*; Or in a *Conservatory of Snow*, where the Cold may be more Constringent; And so make the *Body* more vnited, and thereby more Resplendent.

**M**ens Bodies are heavier, and lesse disposed to Motion, when *Southerne Winds* blow, than when *Northerne*. The Cause is, for that when the *Southerne Winds* blow, the Humours doe (in some Degree) melt, and wax fluide, and so flow into the Parts; As it is seene in *Wood*, and other Bodies; which, when the *Southerne winds* blow, doe swell. Besides, the Motion and Actiuity of the Body consisteth chiefly in the *Sinewes*, which, when the *Southerne Wind* bloweth, are more relax.

**I**T is commonly seene, that more are *Sicke* in the *Summer*, and more *Dye* in the *Winter*; Except it be in *Pestilent Diseases*, which commonly reigne in *Summer*, or *Autumne*. The Reason is, because *Diseases* are bred (indeed) chiefly by *Heat*; But then they are Cured most by *Sweat*, and *Purge*; which in the *Summer* commeth on, or is prouoked, more Easily: As for *Pestilent Diseases*, the Reason why most Die of them in *Summer*, is because they are bred most in the *Summer*; For otherwise those that are touched are in most Danger in the *Winter*.

**T**He Generall Opinion is, that *Yeares Hot* and *Moist*, are most *Pestilent*; Vpon the Superficiall Ground, that *Heat* and *Moisture* cause *Putrefaction*. In *England* it is found not true; For, many times, there haue beene great *Plagues* in *Drie Yeares*. Whereof the Cause may be, for that *Drought* in the Bodies of *Islanders*, habituate to *Moist Aires*, doth Exasperate the Humours, and maketh them more apt to Putrifie, or Enflame: Besides, it tainteth the *Waters* (commonly,) and maketh them lesse wholesome. And againe in *Barbary*, the *Plagues* breake vp in the *Summer-months*, when the *Weather* is *Hot* and *Dry*.

**M**Any *Diseases*, (both *Epidemicall*, and others,) breake forth at *Particular times*. And the Cause is falsely imputed to the *Constitution* of the *Aire*, at that time, when they breake forth, or reigne; whereas it proceedeth (indeed) from a *Precedent Sequence*, and *Series* of the *Seasons* of the *Yeare*: And therefore *Hippocrates*, in his *Prognosticks*, doth make good Observations, of the *Diseases*, that ensue vpon the *Nature*, of the *Precedent foure Seasons* of the *Yeare*.

**T**Riall hath been made, with *Earthen Bottles* well stopped, hanged in a *Well* of Twenty Fathome deep, at the least; And some of the *Bottles* haue beene let downe into the *Water*, some others haue hanged aboue, within about a fathome of the *Water*; And the *Liquors* so tryed haue beene, *Beere*, (not New, but Ready for drinking,) and *Wine*, and *Milke*. The Prooffe hath beene, that both the *Beere*, and the *Wine*, (as well within *Water*, as aboue,) haue not been palled or deaded at all; But

as



as good or somewhat better, than *Bottles* of the same *Draper*, and *Staler* nesse, kept in a *Cellar*. But those which did hang about *Water*, were apparently the best. And that *Beere* did flower a little, whereas that under *Water* did not, though it were *Fresh*. The *Milke* soured, and began to *Putrifie*. Nevertheless it is true, that there is a *Village* neare *Blois*, where in *Deepe Canes* they doe thicken *Milke*; In such sort, that it becometh very pleasant; Which was some *Cause* of this *Triall* of *Hanging Milke* in the *Well*. But our proove was naught: Neither doe I know, whether that *Milke* in those *Canes*, be first boiled. It were good therefore to try it with *Milke* Soddin, and with *Creame*; For that *Milke* of it selfe is such a *Compound Body*, of *Creame*, *Curds*, and *Whey*, as it is easily *Turned*, and *Dissolved*. It were good also to trie the *Beere*, when it is in *Wort*, that it may be seene, whether the *Hanging* in the *Well*, will *Accelerate* the *Ripening* and *Clarifying* of it.

**D**ivers, we see, doe *Stat*. The *Cause* may be, (in most,) the *Refrigeration* of the *Tongue*; Whereby it is less apt to move. And therefore we see, that *Naturalls* doe generally *Stat*. And we see that in those that *Stat*, if they drinke *Wine* moderately, they *Stat* lesse, because it heateth: And so we see, that they that *Stat*, doe *Stat* more in the first *Offer* to speake, than in *Continuance*; Because the *Tongue* is, by *Motion*, somewhat heated. In some also, it may be, (though rarely,) the *Drynesse* of the *Tongue*, which likewise maketh it less apt to move, as well as *Cold*; For it is an *Affect* that cometh to some *Wise* and *Great Men*; As it did unto *Moses*, who was *Lingua praeputa*; And many *Stutterers* (we finde) are very *Cholerick Men*; *Choler* Enducing a *Drynesse* in the *Tongue*.

**S**melles, and other *Odoours*, are *Sweeter* in the *Aire*, at some *Distance*, than neare the *Nose*; As hath beene partly touched heretofore. The *Cause* is double; Either the finer *Mixture*, or *Incorporation* of the *Smells*: For we see that in *Sounds* likewise, they are *Sweetest*, when we cannot heare every *Part* by it selfe. The other *Reason* is, for that all *Sweet Smells* have joyned with them, some *Barthy* or *Crude Odoours*; And at some *Distance* the *Sweet*, which is the more *Spiritually*, is *Perceived*; And the *Earthy* reacheth not so farre.

**S**wet *Smells* are most forcible, in *Drie Substances*, when they are *Broken*; And so likewise in *Oranges*, or *Lemons*, the *Nipping* of their *Rinde*, giueth out their *Smell* more: And generally, when *Bodies* are *Moved* or *Stirred*, though not *Broken*, they *Smell* more. As a *Sweet-Bagge* wauid. The *Cause* is double: The one, first that there is a *Greater Emission* of the *Spirit*, when *Way* is made: And this holdeth in the *Breaking*, *Nipping*, or *Crushing*; It holdeth also, (in some *Degree*) in the *Moving*: But in this last, there is a *Concurrence* of the *Second Cause*, Which is the *Impulsion* of the *Aire*, that bringeth the *Sent* faster opprivs.

The daintiest *Smells* of *Plants* are out of those *Plants*, whose *Leaves* smell not; As *Violets*, *Roses*, *Wall-flowers*, *Gilly-flowers*, *Stickes*, *Woodbines*, *Vine*.

Experiment  
Solitary, touch-  
ing Smelling.

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Experiments  
in Consort,  
touching Smells.

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*Vine-Flowers, Apple-Bloomes, Lime-Tree Bloomes, Beane-Bloomes, &c.* The Cause is, for that where there is Heat and strength enough in the Plant, to make the *Leaves Odorate*, there the *Smell of the Flower* is rather Euanide and Weaker, than that of the *Leaves*; As it is in *Rose-Mary-Flowers, Lavender-Flowers, and Sweet-Briar-Roses*. But where there is lesse Heat, there the *Spirit of the Plant*, is digested and refined, and seuered from the *Grosser Iuyce*, in the *Efflorescence*, and not before.

390 Most *Odours* smell best, *Broken or Crushed*, as hath beene said; But *Flowers Pressed or Beaten*, doe loose the *Freshnesse and Sweetnesse* of their *Odour*. The Cause is, for that when they are *Crushed*, the *Grosser* and more *Earthy Spirit* commeth out with the *Finer*, and troubleth it; Whereas in stronger *Odours* there are no such *Degrees* of the *Issue* of the *Smell*.

Experiments  
in Confort tou-  
ching the Good-  
nesse and Choise  
of Water.

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It is a thing of very good Use, to Discover the *Goodnesse of Waters*. The *Taste*, to those that *Drinke Water* only, doth somewhat: But other *Experiments* are more sure. First, trie *Waters* by *Weight*; Wherein you may finde some difference, though not much: And the *Lighter* you may account the *Better*.

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Secondly, try them by *Boyling* vpon an *Aquall Fire*: And that which consumeth away fastest, you may account the *Best*.

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Thirdly, trie them in *Seuerall Bottles*, or *Open Vessells*, *Matches* in every Thing else, and see which of them *Last Longest*, without *Stench* or *Corruption*. And that which holdeth *Vnputrified* longest, you may likewise account the *Best*.

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Fourthly, trie them by *Making Drinke* Stronger, or Smaller, with the same *Quantitie* of *Mault*; And you may conclude, that that *Water*, which maketh the *Stronger Drinke*, is the more *Concocted*, and *Nourishing*; though perhaps it be not so good for *Medicinnall use*. And such *Water* (commonly) is the *Water* of *Large and Navigable Rivers*: And likewise in *Large and Cleane Ponds* of *Standing Water*: For vpon both them, the *Sunne* hath more power, than vpon *Fountaines*, or *Small Rivers*. And I conceive that *Chalke-water* is next them the best, for going furthest in *Drinke*: For that also helpeth *Concoction*; So it be out of a *Deepe Well*; For then it Cureth the *Rawnesse* of the *Water*; But *Chalkie Water*, towards the *Top* of the *Earth*, is too fretting; As it appeareth in *Laundry* of *Cloaths*, which weare out apace, if you vse such *Waters*.

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Fifthly, The *Houewiues* doe finde a *Difference* in *Waters*, for the *Bearing*, or *Not Bearing* of *Sapre*: And it is likely that the more *Far Water* will beare *Sapre* best; For the *Hungry Water* doth kill the *Vinctuous Nature* of the *Sapre*.

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Sixthly, you may make a *Iudgement* of *Waters*, according to the *Place*, whence they *Spring*, or *Come*: The *Rain-Water* is, by the *Physicians*, esteemed the *Finest*, and the best; But yet it is said to putrifie soonest; which is likely, because of the *Finenesse* of the *Spirit*: And in *Con-*

seruatories



*seruatories of Rain-water;* (such as they haue in *Venice*, &c.) they are found not so *Choice Waters*; The worst (perhaps,) because they are Concreted aloft, and kept from the Sunne. *Snow-water* is held vntwofold; In so much as the People, that dwell at the Foot of the *Snow-Mountaines*, or otherwise vpon the Ascent (especially the Women) by drinking of *Snow-water*, haue great Bags hanging vnder their Throats. *Well-water*, except it be vpon *Chalke*, or a very plentiful Spring, maketh Meas Red; which is an ill Signe. Springs on the Tops of High Hills are the best: For both they seeme to haue a Lightnesse, and Appetite of Mounting; And besides they are most pure and Vnmingled; And againe are more Percolated thorow a great Space of Earth. For *Waters* in *Valleys*, ioyne in effect vnder Ground with all *Waters* of the same *Leuell*; Whereas Springs, on the Tops of Hills, passe thorow a great deale of Pure Earth, with lesse Mixture of other *Waters*.

Seuenthly, Iudgement may be made of *Waters*, by the Soile whereupon the Water runneth; As *Pebble* is the Cleanest, and best tasted; And next to that *Clay-water*; And Thirdly, *Water* vpon *Chalke*; Fourthly, that vpon *Sand*; And Worst of all vpon *Mud*. Neither may you trust *Waters* that Taste Sweet; For they are commonly found in Rising Grounds of great Cities; which must needs take in a great deale of Filth.

**I**N *Peru*, and diuers Parts of the *West Indies*, though vnder the Line, the Heats are not so Intolerable, as they be in *Barbary*, and the Skirts of the *Torrid Zone*. The Causes are, First the Great *Brizes*, which the Motion of the Aire in great Circles, (such as are vnder the Girdle of the World,) produceth; Which doe refrigerate; And therefore in those Parts Noone is nothing so hot, when the *Brizes* are great, as about Nine or Ten of the Clocke in the Fore-Noone. Another Cause is, for that the Length of the Night, and the Dewes thereof, doe compense the Heat of the Day. A third Cause is the Stay of the Sunne; Not in Respect of Day and Night, (for that we spake of before,) but in Respect of the Season; For vnder the Line, the Sunne crosseth the Line, and maketh two Summers, and two Winters; But in the Skirts of the *Torrid Zone*, it doubleth, and goeth backe againe, and so maketh one Long Summer.

**T**HE Heat of the Sunne maketh Men Blacke in some Countries, as in *Aethiopia*, and *Ginny*, &c. Fire doth it not, as we see in *Glasse-Men*, that are continually about the Fire. The Reason may be, because Fire doth licke vp the Spirits, and Bloud of the Body, so as they Exhale; So that it euer maketh Men looke Pale, and Sallow; But the Sunne, which is a Gentler Heat, doth but draw the Bloud to the Outward Parts; And rather Concocteth it, than Soaketh it: And therefore we see that all *Aethiopes* are Flethy, and Plumpe, and haue great Lips; All which betoken Moisture retained, and not drawne out. We see also, that the

Experiment  
Solitary touching  
the Temperature  
Heat vnder  
the Equinoctiall.  
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Experiment  
Solitary touching  
the Temperature  
Heat vnder  
the Equinoctiall.  
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Experiment  
Solitary touching  
the Coloration  
of Blacke  
and Tawny  
Moors.  
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*Negroes* are bred in Countries that haue Plenty of Water, by *Riues* or otherwise: For *Meroë*, which was the *Metropolis* of *Aethiopia*, was vpon a great Lake: And *Congo*, where the *Negroes* are, is full of *Riues*. And the *Confines* of the *Riuer Niger*, where the *Negroes* also are, are well watered: And the Region about *Capo Verde*, is likewise Moist, in so much as it is pestilent through Moisture: But the Countries of the *Abyssenes*, and *Barbary*, and *Pern*, where they are Tawney, and Oliuaster, and Pale, are generally more Sandy and Dry. As for the *Aethiopes*, as they are Plumpe, and Fleehy; So (it may be) they are Sanguine, and ruddy Coloured, if their blacke Skin would suffer it to be scene.

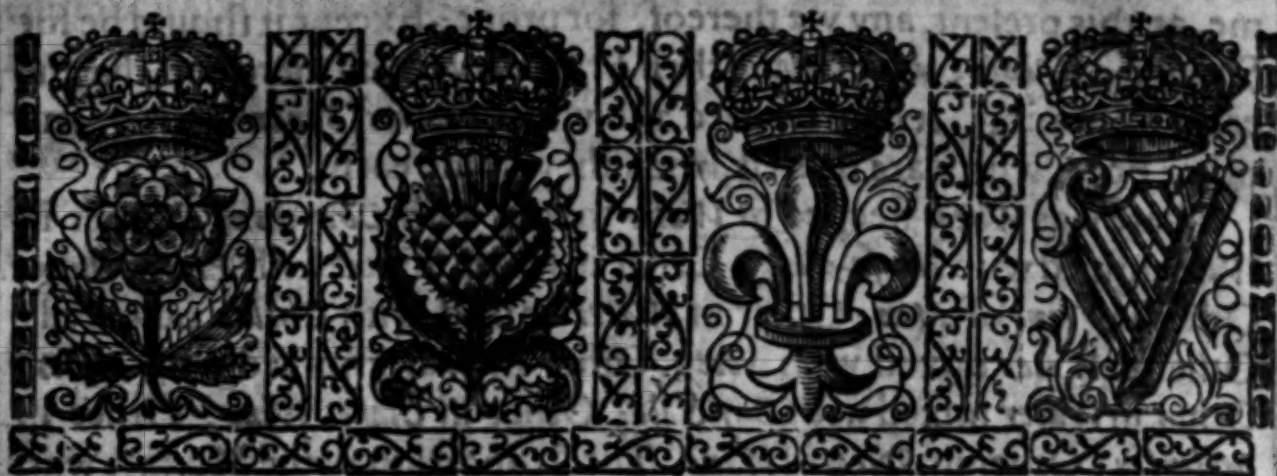
Experiment  
Solitary tou-  
ching Motion  
after the In-  
stant of Death.

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**S**OME *Creatures* doe moue a good while after their Head is off; As *Birds*; Some a very little time; As *Men*, and all beasts; Some moue, though cut in seuerall Peeces; As *Snakes*, *Eeles*, *Wormes*, *Flies*, &c. First therefore it is certaine, that the *Immediate Cause* of Death, is the Resolution or Extinguishment of the *Spirits*; And that the Destruction or Corruption of the *Organs*, is but the *Mediate Cause*. But some *Organs* are so peremptorily necessary, that the Extinguishment of the *Spirits* doth speedily follow; But yet so, as there is an *Interim* of a Small Time. It is reported by one of the *Ancients*, of credit, that a *Sacrificed Beast* hath lowed, after the Heart hath beene seuered; And it is a Report also of Credit, that the Head of a *Pig* hath beene opened, and the Braine put into the Palme of a Mans hand, trembling, without breaking any part of it, or seuering it from the Marrow of the Back-bone; During which time the *Pig* hath beene, in all appearance, starke dead, and without Motion; And after a small Time the Braine hath beene replaced, and the Skul of the *Pig* closed, and the *Pig* hath a little after gone about. And certaine it is, that an *Eye* vpon *Reuenge* hath beene thrust forth, so as it hanged a pretty distance by the *Visuall Nerue*; And during that time the *Eye* hath beene without any Power of *Sight*; And yet after (being replaced) recovered *Sight*. Now the *Spirits* are chiefly in the Head, and *Cells* of the Braine, which in *Men*, and *Beasts* are Large; And therefore, when the Head is off, they moue little or Nothing. But *Birds* haue small Heads, and therefore the *Spirits* are a little more dispersed in the *Sinewes*, whereby Motion remaineth in them a little longer; In so much as it is Extant in Story, that an *Emperour* of *Rome*, to shew the Certainty of his Hand, did Shoot a great Forked Arrow at an *Estrich*, as she ranne swiftly vpon the Stage, and strooke off her Head; And yet she continued the Race, a little way, with the Head off. As for *Wormes*, and *Flies*, and *Eeles*, the *Spirits* are diffused almost all ouer; And therefore they moue in their Seuerall Peeces.

NATV.





# NATVRALL HISTORIE.

## V. Century.



E will now enquire of *Plants* or *Vegetables*: And we shall doe it with diligence. They are the principall Part of the *Third Daies Worke*. They are the first *Producat*, which is the Word of *Animation*: For the other Words are but the Words of *Essence*; And they are of excellent and generall Vse, for Food, Medicine, and a Number of Mechanicall Arts.

There was sowne in a *Bed*, *Turnip-Seed*, *Radish-Seed*, *Wheat*, *Cucumber-Seed*, and *Pease*. The *Bed* we call a *Hot-Bed*, and the Manner of it is this. There was taken *Horse-dung*, old, and well rotted; This was laid vpon a Banke, halfe a foot high, & supported round about with Planks; And vpon the Top was cast Sifted Earth, some two Fingers deep; And then the *Seed* sprinkled vpon it, hauing beene steeped all night in *Water* Mixed with *Cow-dung*. The *Turnip-Seed*, and the *Wheat* came vp halfe an Inch aboue Ground, within two daies after, without any *Warring*. The Rest the third day. The *Experiment* was made in *October*; And (it may be) in the *Spring*, the *Accelerating* would haue beene the speedier. This is a Noble *Experiment*; For without this helpe, they would haue

Experiments  
in Consort  
touching the  
*Acceleration* of  
*Germination*.

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beene foure times as long in comming vp. But there doth not occur to me, at this present, any vse thereof, for profit; Except it should be for Sowing of *Pease*; which haue their Price very much increased, by the early Comming. It may be tried also with *Cherries*, *Straw-berries*, and other Fruit, which are dearest, when they come early.

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There was *Wheat* steeped in *Water* mixed with *Cow-dung*; Other in *Water* mixed with *Horse-dung*; Other in *Water* mixed with *Pigeon-dung*; Other in *Urine* of *Man*; Other in *Water* mixed with *Chalke* powdered; Other in *Water* mixed with *Soot*; Other in *Water* mixed with *Asbes*; Other in *Water* mixed with *Bay-Salt*; Other in *Claret Wine*; Other in *Malmsey*; Other in *Spirit of Wine*. The Proportion of the Mixture was, a fourth Part of the Ingredients to the *Water*; Saue that there was not of the *Salt* above an eighth Part. The *Urine*, and *Wines*, and *Spirit of Wine*, were Simple without Mixture of *Water*. The Time of the Steeping was twelue houres. The Time of the Yeere *October*. There was also other *Wheat* sowne vnsteeped, but watered twice a day with *Warmed water*. There was also other *Wheat* sowne Simple to compare it with the rest. The Euent was; That those that were in the Mixture of *Dung*, and *Urine*, and *Soot*, *Chalke*, *Asbes*, and *Salt*, came vp within six daies: And those that afterwards proued the Highest, Thickest, and most Lustie, were; First the *Urine*; And then the *Dungs*; Next the *Chalke*; Next the *Soot*; Next the *Asbes*; Next the *Salt*; Next the *Wheat Simple* of it selfe, vnsteeped, and vnwatered; Next the *Watered twice a day* with warme water; Next the *Claret Wine*. So that these three last were slower than the ordinary *Wheat* of it selfe; And this Culture did rather retard, than aduance. As for those that were steeped in *Malmsey*, and *Spirit of Wine*, they came not vp at all. This is a Rich Experiment for Profit: For the most of the Steepings are Cheape Things; And the Goodnesse of the Crop is a great Matter of Gaine; If the Goodnesse of the Crop answer the Earlinesse of the Comming vp: As it is like it will; Both being from the vigour of the *Seed*; Which also partly appeared in the Former Experiments, as hath beene said. This Experiment would be tried in other *Graines*, *Seeds*, and *Kernels*: For it may be some Steeping will agree best with some *Seeds*. It would be tried also with *Roots* steeped as before, but for longer time. It would be tried also in *Seuerall Seasons* of the Yeere, especially the *Spring*.

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*Strawberries* watered now and then (as once in three daies) with *Water*, wherein hath beene steeped *Sheepes-dung*, or *Pigeons-dung*, will preuent and come early. And it is like, the same Effect would follow in other *Berries*, *Herbs*, *Flowers*, *Graines*, or *Trees*. And therefore it is an Experiment, though vulgar in *Strawberries*, yet not brought into vse generally: For it is vsuall to helpe the Ground with Mucke; And likewise to Recomfort it sometimes with Mucke put to the *Roots*; But to water it with *Mucke water*, which is like to be more Forcible, is not practised.

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*Dung*, or *Chalke*, or *Bloud*, applied in Substance, (seasonably) to the *Roots*



Roots of Trees, doth set them forwards. But to doe it vnto *Herbs*, without Mixture of *Water* or *Earth*, it may bee these Helpes are too Hot.

The former *Meanes* of Helping *Germination*, are either by the Goodnesse and *Strength* of the *Nourishment*; Or by the *Comforting*, and *Exciting* the *Spirits* in the *Plant*, to draw the *Nourishment* better. And of this latter kinde, concerning the *Comforting* of the *Spirits* of the *Plant*, are also the experiments that follow; Though they be not Applications to the *Root*, or *Seed*. The *Planting* of *Trees* warme vpon a *Wall*, against the South, or South-East Sunne, doth hasten their *Comming* on, and *Ripening*; And the South-East is found to be better than the South-West, though the South-West be the Hotter Coast. But the cause is chiefly, for that the Heat of the Morning succeedeth the Cold of the Night: and partly, because (many times) the South-west Sunne is too Parching. So likewise the *Planting* of them vpon the *Backe* of a *Chimney*, where a *Fire* is kept, doth hasten their *Comming* on, and *Ripening*: Nay more, the *Drawing* of the *Boughes* into the *Inside* of a *Roome*, where a *Fire* is continually kept, worketh the same Effect; Which hath beene tried with *Grapes*; In so much as they will come a Moneth earlier, than the *Grapes* abroad.

Besides the two *Meanes* of *Accelerating Germination*, formerly described; That is to say, the *Mending* of the *Nourishment*; and *Comforting* of the *Spirit* of the *Plant*; there is a Third; Which is the *Making way* for the *Easie Comming* to the *Nourishment*, and *Drawing* it. And therefore *Gentle Digging* and *Loosening* of the *Earth* about the *Roots* of *Trees*; And the *Remouing Herbs* and *Flowers* into new *Earth*, once in two yeeres, (which is the same thing; For the new *Earth* is euer looser) doth greatly further the *Prospering*, and *Earlinesse* of *Plants*.

But the most admirable *Acceleration* by *Facilitating* the *Nourishment*, is that of *Water*. For a *Standard* of a *Damaske Rose* with the *Root* on, was set in a Chamber, where no *Fire* was, vpright in an *Earthen Panne*, full of *Faire Water*, without any Mixture, halfe a foot vnder the *Water*, the *Standard* being more than two foot high aboue the *Water*: Within the Space of ten daies, the *Standard* did put forth a faire Greene leafe, and some other little Buds, which stood at a stay, without any Shew of decay or withering, more than seuen Daies. But afterwards that *Leafe* faded, but the young Buds did sprout on; which afterward opened into faire *Leaues*, in the space of three Moneths; And continued so a while after, till vpon Remouall wee left the *Triall*. But note that the *Leaues* were somewhat paler, and lighter-coloured, than the *Leaues* vse to bee abroad. Note that the first Buds were in the End of *October*; And it is likely that if it had beene in the *Spring* time, it would haue put forth with greater strength, and (it may bee) to haue growne on to beare *Flowers*. By this *Meanes*, you may haue (as it seemeth) *Roses* set in the midst of a *Poole*, being supported with some stay; Which is Matter of Rarenesse and Pleasure, though of small Vse. This is the more

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strange, for that the like *Rose-standard* was put, at the same time, into *Water* mixed with *Horse-dung*, the *Horse-dung* about the fourth Part to the *Water*, and in foure Moneths space (while it was obserued) put not forth any *Leafe*, though diuers *Buds* at the first, as the other.

A *Dutch Flower*, that had a *Bulbous Root*, was likewise put, at the same time, all vnder *Water*, some two or three Fingers deepe; And within seven daies sprouted, and continued long after, further Growing. There were also put in, a *Beet-Root*, a *Borage-Root*, and a *Raddish-Root*, which had all their *Leaves* cut almost close to the *Roots*; And within six weekes had faire *Leaves*; And so continued till the end of *November*.

Note that if *Roots*, or *Pease*, or *Flowers*, may bee *Accelerated* in their *Coming* and *Ripening*, there is a double Profit; The one in the high *Price* that those Things beate when they come early: The other in the *Swiftnesse* of their *Returns*: For in some Grounds which are strong, you shall haue a *Raddish*, &c. come in a Month; That in other Grounds will not come in two; And so make double *Returns*.

*Wheat* also was put into the *Water*, and came not forth at all; So as it seemeth there must be some Strength and Bulke in the Body, put into the *Water*, as it is in *Roots*; For *Graines* or *Seeds*, the Cold of the *Water* will mortifie. But casually some *Wheat* lay vnder the Pan, which was somewhat moistned by the Suing of the Pan; which in six weekes (as aforesaid) looked mouldy to the Eye, but it was sprouted forth halfe a Fingers length.

It seemeth by these *Instances* of *Water*, that for *Nourishment*, the *Water* is almost all in all, and that the *Earth* doth but keepe the *Plant* vp-right, and saue it from *Ouer-heat*, and *Ouer-cold*; And therefore is a Comfortable *Experiment* for good *Drinkers*. It proueth also that our former *Opinion*; That *Drinke* incorporate with *Flesh*, or *Roots*, (as in *Capon-Beere*, &c.) will nourish more easily, than *Meat* and *Drinke* taken seuerally.

The *Housing* of *Plants* (I conceiue) will both *Accelerate Germination*, and bring forth *Flowers* and *Plants* in the *Colder Seasons*: And as wee *House Hot-Country Plants*, as *Lemons*, *Oranges*, *Myrtles*, to saue them; So we may *House* our owne *Country Plants*, to forward them, and make them come in the *Cold Seasons*; In such sort, that you may haue *Violets*, *Strawberries*, *Pease*, all *Winter*: So that you sow, or remoue them at fit times. This *Experiment* is to be referred vnto the *Comforting* of the *Spirit* of the *Plants*, by *Warmth*, as well as *Housing* their *Boughs*, &c. So then the *Meanes*, to *Accelerate Germination*, are in Particular eight, in Generall three.

To make *Roses*, or other *Flowers* come late, it is an *Experiment* of Pleasure. For the Ancients esteemed much of *Rosa Sera*. And indeed the *November-Rose* is the sweetest, hauing bin lesse exhaled by the *Sunne*. The *Meanes* are these. First, the *Cutting off their Tops*, immediately after they haue done *Bearing*; And then they will come againe the

Experiments  
in Confort  
touching the  
Putting backe or  
Retardation of  
Germination.

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the same yeare about *November*: But they will not come iust on the Tops, where they were cut, but out of those Shoots, which were, (as it were,) *Water-Boughes*. The *Cause* is, for that the Sap, which otherwise would haue fed the Top, (though after Bearing,) will, by the discharge of that, diuert vnto the *Side-Sprouts*; And they will come to beare, but later.

The Second is the *Pulling off the Buds of the Rose*, when they are *Newly knotted*; For then the *Side-Branches* will beare. The *Cause* is the same with the former: For *Cutting off the Tops*, and *Pulling off the Buds*, worke the same Effect, in Retention of the Sap for a time, and Diuersion of it to the Sprouts, that were not so forward.

The Third is the *Cutting off some few of the Top-boughes* in the *Spring-time*, but suffering the lower Boughes to grow on. The *Cause* is, for that the Boughes doe helpe to draw vp the Sap more strongly; And we see that in *Powling of Trees*, many doe vse to leaue a Bough or two on the Top, to helpe to draw vp the Sap. And it is reported also, that if you graft vpon the Bough of a Tree, and cut off some of the old Boughes, the new Cions will perish.

The Fourth is by *Laying the Roots bare about Christmas*, some dayes. The *Cause* is plaine, for that it doth arrest the Sap, from going vpwards, for a time; Which Arrest is afterwards released by the Couering of the Root againe with Earth; And then the Sap getteth vp, but later.

The Fifth is the *Remouing of the Tree*, some Moneth before it *Buddeth*. The *Cause* is, for that some time will be required after the *Remoue*, for the *Resetling*, before it can draw the Iuyce: And that time being lost, the Blossome must needs come forth later.

The Sixth is the *Grafting of Roses in May*, which commonly Gardiners doe not till *July*; And then they beare not till the Next Yeare; But if you graft them in *May*, they will beare the same yeare, but late.

The Seuenth is, the *Girding of the Body of the Tree* about with some Pack-threed; For that also, in a degree, restraineth the Sap, and maketh it come vp, more late, and more Slowly.

The Eighth is, the *Planting of them in a Shade*, or in a *Hedge*; The *Cause* is, partly the Keeping out of the Sunne, which hasteneth the Sap to rise; And partly the Robbing of them of Nourishment, by the Stuffle in the *Hedge*. These Meanes may be practised vpon other, both Trees, and Flowers, *Mutatis Mutandis*.

Men haue entertained a Conceit that sheweth prettily; Namely, that if you graft a *Late-Comming Fruit*, vpon a Stocke of a *Fruit-tree* that *Commeth early*, the Graft will beare *Fruit early*; As a Peach vpon a *Cherrie*; And contrariwise, if an *Early-Comming-Fruit* vpon a Stocke of a *Fruit-Tree* that *Commeth late*, the Graft will beare *Fruit late*; As a *Cherry* vpon a *Peach*. But these are but Imaginations, and vntrue. The *Cause* is, for that the Cions ouer-ruleth the Stocke quite; And the Stocke is but *Passiue* only, and giueth Aliment, but no Motion to the Graft.

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Experiments  
in Consort,  
touching the  
Melioration of  
Fruits, Trees,  
and Plants.

We will speake now, how to make *Fruits, Flowers,* and *Roots* larger; in more plentie; and sweeter; than they vse to be; And how to make the *Trees* themselves, more Tall; more Spread; and more Hastie and Sudden; than they vse to be. Wherein there is no doubt, but the former *Experiments* of *Acceleration*, will serue much to these purposes. And againe, that these *Experiments*, which we shall now set downe, doe serue also for *Acceleration*; because both Effects proceed from the Encrease of Vigour in the Tree; But yet to auoid Confusion; And because some of the Meanes are more proper for the one Effect, and some for the other, we will handle them apart.

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It is an assured Experience, that an *Heape* of *Flint*, or *Stone*, laid about the *Bottom* of a *Wilde-Tree*, (as an *Oake*, *Elme*, *Ash*, &c.) vpon the first Planting, doth make it prosper double as much, as without it. The *Cause* is, for that it retaineth the Moisture, which falleth at any time vpon the *Tree*, and suffereth it not to be exhaled by the Sunne. Againe, it keepeth the *Tree* warme, from *Cold Blasts* and *Frosts*, as it were in an *House*. It may be also, there is somewhat in the Keeping of it steady at the first. *Quare*, if Laying of *Straw* some Height about the *Bodie* of a *Tree*, will not make the *Tree* forwards. For though the *Root* giueth the *Sap*, yet it is the *Body* that draweth it. But you must note, that if you lay *Stones* about the *stalke* of *Lettuce*, or other *Plants*, that are more soft, it will ouer-moisten the *Roots*, so as the *Wormes* will eat them.

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A *Tree*, at the first *Setting*, should not be *Shaken*, vntill it hath taken *Root* fully: And therefore some haue put two little *Forkes* about the *Bottom* of their *Trees*, to keepe them vpright; But after a yeares *Rooting*, then *Shaking* doth the *Tree* good, by *Loosening* of the *Earth*, and (perhaps) by *Exercising* (as it were) and *Stirring* the *Sap* of the *Tree*.

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Generally, the *Cutting away* of *Boughes* and *Suckers* at the *Root* and *Bodie*, doth make *Trees* grow high; And contrariwise, the *Powling* and *Cutting* of the *Top*, maketh them grow spread, and bushy. As we see in *Pollards*, &c.

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It is reported, that to make *hasty Growing Coppice-Woods*, the way is, to take *Willow*, *Sallow*, *Poplar*, *Alder*, of some seuen yeares growth; And to set them, not vpright, but a slope, a reasonable depth vnder the *Ground*; And then, in stead of one *Root*, they will put forth many, and so carry more *Shoots* vpon a *Stemme*.

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When you would haue many new *Roots* of *Fruit-trees*, take a *Low Tree*, and bow it, and lay all his *Branches* a-flat vpon the *Ground*, and cast *Earth* vpon them; And euery *Twigge* will take *Root*. And this is a very profitable *Experiment* for *Costly Trees*; (for the *Boughes* will make

Stockes



Stockes without charge; ) Such as are *Apricots, Peaches, Almonds, Cornelians, Mulberries, Figs, &c.* The like is continually practised with *Vines, Roses, Muske-Roses, &c.*

From *May* to *July* you may take off the *Barke* of any *Bough*, being of the Bignesse of three or foure Inches, and couer the bare Place, somewhat aboue, and below, with Loame well tempered with Horse-dung, binding it fast downe. Then cut off the Bough about *Albountide* in the bare place, and set it in the Ground; And it will grow to be a faire *Tree* in one Year. The *Cause* may be, for that the *Baring* from the *Barke* keepeth the *Sap* from descending towards Winter, and so holdeth it in the Bough; And it may be also that the Loame and Horse-Dung applied to the bare place, doe moisten it, and cherish it, and make it more apt to put forth the Root. Note, that this may be a generall Meanes for keeping vp the *Sap* of *Trees* in their Boughes; Which may serue to other Effects.

It hath beene practised in *Trees*, that shew faire, and beare not, to Bore a Hole thorow the *Heart* of the *Tree*, and thereupon it will beare. Which may be for that the *Tree* before had too much *Repletion*, and was oppressed with his owne *Sappe*; For *Repletion* is an Enemie to Generation.

It hath beene practised in *Trees*, that doe not beare, to cleaue two or three of the Chiefe Roots, and to put into the Cleft a small Pebble, which may keepe it open, and then it will beare. The *Cause* may be, for that a Root of a *Tree* may be (as it were,) Hide-bound, no lesse than the Body of the *Tree*; But it will not keepe open without somewhat put into it.

It is vsually practised, to set *Trees* that require much *Sunne*, vpon *Walls* against the *South*; As *Apricots, Peaches, Plums, Vines, Figs*, and the like. It hath a double Commoditie; The one, the *Heat* of the *Wall* by *Reflexion*; The other, the *Taking away* of the *Shade*; For when a *Tree* groweth round, the vpper Boughes ouer-shadow the lower; But when it is spread vpon a *Wall*, the *Sunne* commeth alike, vpon the vpper, and lower Branches.

It hath also beene practised (by some) to pull off some *Leaves* from the *Trees* so spread, that the *Sunne* may come vpon the *Bough* and *Fruit* the better. There hath beene practised also a Curiositie, to set a *Tree* vpon the *North-Side* of a *Wall*, and at a little height, to draw him thorow the *Wall*, and spread him vpon the *South-Side*: Conceiuing that the Root and lower Part of the Stocke should enioy the Freshnesse of the *Shade*; And the Vpper Boughes, and *Fruit*, the Comfort of the *Sunne*. But it sorted not; The *Cause* is, for that the *Root* requireth some Comfort from the *Sunne*, though vnder *Earth*, as well as the *Body*: And the Lower Part of the *Body* more than the Vpper, as wee see in *Compassing* a *Tree* below with *Straw*.

The *Lownesse* of the *Bough*, where the *Fruit* commeth, maketh the *Fruit* greater, and to ripen better; For you shall euer see in *Apricots, Peaches,*

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*Peaches*, or *Melo-Cotones*, vpon a wall, the greatest Fruits towards the Bottom. And in *France* the *Grapes* that make the *Wine*, grow vpon low Vines, bound to small Stakes. And the raised Vines in *Arbours* make but Veriuyce. It is true, that in *Italy*, and other *Countries*, where they haue hotter Sunne, they raise them vpon *Elmes*, and *Trees*; But I conceiue, that if the *French* Manner of Planting low, were brought in vse there, their *Wines* would be stronger and sweeter. But it is more chargeable in respect of the Props. It were good to trie whether a *Tree* grafted somewhat neare the Ground, and the lower boughes only maintained, and the higher continually pruned off, would not make a larger Fruit.

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To haue Fruit in Greater Plentie, the way is, to graft, not onely vpon young *Stocks*, but vpon diuers *Boughes* of an old *Tree*; for they will beare great Numbers of Fruit; Whereas if you graft but vpon one *Stocke*, the *Tree* can beare but few.

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The Digging yearely about the *Roots* of *Trees*, which is a great means, both to the Acceleration and Melioration of Fruits, is practised in nothing but in *Vines*; Which if it were transferred vnto other *Trees*, and *Shrubs*, (as *Roses*, &c.) I conceiue would aduance them likewise.

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It hath beene knowne, that a *Fruit-Tree* hath beene blowne vp (almost) by the *Roots*, and set vp againe, and the next yeare bare exceedingly. The Cause of this, was nothing but the Loosening of the *Earth*, which comforteth any *Tree*, and is fit to be practised, more than it is, in *Fruit-Trees*: For *Trees* cannot be so fitly remoued into New Grounds, as *Flowers* and *Herbs* may.

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To reuiue an *Old Tree*, the Digging of it about the *Roots*, and Applying new Mould to the *Roots*, is the way. We see also that *Draught-Oxen*, put into fresh Pasture, gather new and tender Flesh; And in all Things, better nourishment than hath beene vsed, doth helpe to renew; Especially, if it be not onely better, but changed, and differing from the former.

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If an *Herbe* be cut off from the *Roots*, in the beginning of Winter, and then the *Earth* be troden and beaten downe hard, with the Foot and Spade, the *Roots* will become of very great Magnitude in Summer. The Reason is, for that the Moisture being forbidden to come vp in the Plant, stayeth longer in the Root, and so dilateth it. And *Gardiners* vse to tread downe any loose Ground, after they haue sowne *Onions*, or *Turnips*, &c.

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If *Panicum* be laid below, and about the Bottom of a *Root*, it will cause the Root to grow to an Excessiue Bignesse. The Cause is, for that being it selfe of a Spungy Substance, it draweth the Moisture of the *Earth* to it, and so feedeth the Root. This is of greatest vse for *Onions*, *Turnips*, *Parfnips*, and *Carrets*.

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The Shifting of Ground is a Meanes to better the *Tree*, and Fruit; But with this Caution; That all Things doe prosper best, when they are aduanced to the better: Your *Nursery* of *Stockes* ought to be in a more Barren



Barren Ground, than the Ground is whereunto you remove them. So all *Grafters* preferre their Cattell from meaner Pastures to better. We see also, that Hardnesse in Youth lengthneth Life, because it lea- ueth a Cherishing to the better of the Bodie, in Age: Nay in Exer- cises, it is good to beginne with the hardest, as Dancing in Thicke Shoes, &c.

It hath beene obserued, that *Hacking* of *Trees* in their *Barke*, both downe-right, and acrosse, so as you make them rather in slices, than in continued Hacks, doth great good to *Trees*; And especially deliuereth them from being *Hide-bound*, and killeth their *Mosse*.

*Shade* to some *Plants* conduceth to make them large, and prospe- rous, more than *Sunne*; As in *Straw-berries*, and *Bayes*, &c. Therefore amongst *Strawberries*, sow here and there some *Borage-Seed*; And you shall finde the *Strawberries* vnder those *Leaves* farre more large than their Fellowes. And *Bayes* you must plant to the *North*; Or defend them from the *Sunne* by a Hedge-Row; And when you sow the *Ber- ries*, weed not the *Borders*, for the first halfe yeare; For the *Weed* giueth them *Shade*.

To increase the *Crops* of *Plants*, there would be considered, not only the *Increasing* the *Lust* of the *Earth*, or of the *Plant*, but the sauing also of that which is spilt. So they haue lately made a *Triall*, to *Set Wheat*; which neuerthelesse hath beene left off, because of the trouble and paines; Yet so much is true, that there is much saued by the *Setting*, in comparison of that which is *Sowen*; Both by keeping it from being picked vp by *Birds*; And by Auoiding the Shallow lying of it, whereby much that is sown taketh no Root.

It is prescribed by some of the *Ancients*, that you take *Small Trees*, vp- on which *Figs* or other *Fruit* grow, being yet vnripe, and couer the *Trees* in the Middle of *Autumne* with dung, vntill the Spring; And then take them vp in a warme day, and replant them in good Ground; And by that meanes, the former yeares *Tree* will be ripe, as by a new Birth; when other *Trees* of the same kind, doe but blossome. But this seemeth to haue no great Probability.

It is reported, that if you take *Nitre*, and mingle it with *Water*, to the thicknesse of *Honey*, and therewith annoint the *Bud*, after the *Vine* is cut, it will sprout forth within eight dayes. The *Cause* is like to be, (if the *Experiment* be true,) the Opening of the *Bud*, and of the Parts Conti- guous, by the Spirit of the *Nitre*; For *Nitre* is (as it were) the Life of *Vegetables*.

Take *Seed*, or *Kernells* of *Apples*, *Peares*, *Oranges*; Or a *Peach*, or a *Plum-Stone*, &c. And put them into a *Squill*, (which is like a great *Onion*,) and they will come vp much earlier than in the *Earth* it selfe. This I conceiue to be as a Kinde of *Grafting* in the *Root*; For as the Stocke of a Graft yeeldeth better prepared Nourishment to the Graft, than the Crude Earth; So the *Squill* doth the like to the *Seed*. And I suppose the same would be done, by Putting *Kernells* into a *Turnip*, or the

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the like; Saue that the *Squill* is more Vigorous, and Hot. It may be tried also, with putting *Onion-Seed* into an *Onion-Head*, which thereby (perhaps) will bring forth a larger, and earlier *Onion*.

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The *Pricking* of a *Fruit* in severall places, when it is almost at his Bignesse, and before it ripeneth, hath beene practised with successe, to ripen the *Fruit* more suddenly. Vvee see the Example of the *Biting* of *Wasps*, or *Wormes*, vpon *Fruit*, whereby it (manifestly) ripeneth the sooner.

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It is reported, that *Alga Marina* (*Sea-weed*) put vnder the *Roots* of *Cole-worts*, and (perhaps) of other *Plants*, will further their Growth. The vertue (no doubt) hath Relation to *Salt*, which is a great Helpe to Fertility.

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It hath beene practised, to cut off the *Stalkes* of *Cucumbers*, immediately after their *Bearing*, close by the *Earth*; And then to cast a prettie Quantitie of *Earth* vpon the *Plant* that remaineth; and they will beate the next yeare *Fruit*, long before the ordinary time. The *Cause* may be, for that the *Sap* goeth downe the sooner, and is not spent in the *Stalke* or *Leafe*, which remaineth after the *Fruit*. Where note, that the *Dying*, in the *Winter*, of the *Roots* of *Plants*, that are *Annua*l, seemeth to be partly caused by the *Ouer-Expence* of the *Sap* into *Stalke*, and *Leaues*; which being preuented, they will super-annate, if they stand warme.

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The *Pulling off* many of the *Blossomes* from a *Fruit-Tree*, doth make the *Fruit* fairer. The *Cause* is manifest; For that the *Sap* hath the lesse to nourish. And it is a *Common Experience*, that if you doe not pull off some *Blossomes*, the first time a *Tree* bloometh, it will blossome it selfe to death.

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It were good to try, what would be the Effect, if all the *Blossomes* were pulled from a *Fruit-Tree*; Or the *Acornes* and *Chesnut-buds*, &c. from a *Wilde Tree*, for two yeares together. I suppose that the *Tree* will either put forth, the third yeare, bigger, and more plentifull *Fruit*; Or else, the same yeares, larger *Leaues*, because of the *Sap* stored vp.

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It hath beene generally receiued, that a *Plant watered* with *Warme Water*, will come vp sooner and better, than with *Cold Water*, or with *Showers*. But our *Experiment* of *Watering Wheat* with *Warme Water* (as hath beene said) succeeded not; which may be, because the *Triall* was too late in the *Yeare*, viz. in the End of *October*. For the *Cold* then comming vpon the *Seed*, after it was made more tender by the *Warme Water*, might checke it.

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There is no doubt, but that *Grafting* (for the most Part) doth meliorate the *Fruit*. The *Cause* is manifest; For that the *Nourishment* is better prepared in the *Stocke*, than in the *Crude Earth*: But yet note well, that there be some *Trees*, that are said to come vp more happily from the *Kernell*, than from the *Graft*; As the *Peach*, and *Melocotone*. The *Cause* I suppose to be, for that those *Plants* require a *Nourishment* of great *Moisture*; And though the *Nourishment* of the *Stocke* be finer, and



and better prepared, yet it is not so moist, and plentiful, as the Nourishment of the Earth. And indeed we see those *Fruits* are very Cold *Fruits* in their Nature.

It hath been received, that a Smaller *Pear*, grafted vpon a *Stocke* that beareth a greater *Pear*, will become Great. But I thinke it is as true, as that of the *Prime-Fruit* vpon the *Late-Stocke*; And e *conuerso*; which we rejected before. For the *Cions* will gouerne. Neuertheless it is probable enough, that if you can get a *Cions* to grow vpon a *Stock* of another kinde, that is much moister than his owne *Stocke*, it may make the *Fruit* Greater, because it will yeeld more plentiful nourishment; Though it is like it will make the *Fruit* Baser. But generally, the *Grafting* is vpon a dryer *Stock*; As the *Apple* vpon a *Crab*; The *Pear* vpon a *Thorne*; &c. Yet it is reported, that in the *Low-Countries* they will graft an *Apple-Cions* vpon the *Stocke* of a *Colewort*, and it will beare a great flaggy *Apple*; The *Kernell* of which, if it be set, will be a *Colewort*, and not an *Apple*. It were good to try, whether an *Apple-Cions* will prosper, if it be grafted vpon a *Sallow*, or vpon a *Poplar*, or vpon an *Alder*, or vpon an *Elme*, or vpon an *Horse-Plumme*, which are the moistest of *Trees*. I haue heard that it hath beene tried vpon an *Elme*, and succeeded;

It is manifest by Experience, that *Flowers* Remoued wax greater, because the Nourishment is more easily come by, in the loose Earth. It may be, that Oft Regrafting of the same *Cions*, may likewise make *Fruit* greater; As if you take a *Cions*, and graft it vpon a *Stocke* the first yeere; And then cut it off, and graft it vpon another *Stocke* the second yeere; and so for a third; Or fourth yeere; And then let it rest, it will yeeld afterward, when it beareth, the greater *Fruit*.

Of Grafting there are many Experiments worth the Noting, but those we reserve to a proper Place.

It maketh *Figs* better, if a *Fig-Tree*, when it beginneth to put forth Leaues, haue his Top cut off. The cause is plaine, for that the Sap hath the lesse to feed, and the lesse way to mount: But it may be, the *Fig* will come somewhat later, as was formerly touched. The same may be tried likewise in other *Trees*.

It is reported, that *Mulberries* will bee fairer, and the *Trees* more fruitfull, if you bore the *Truncke* of the *Tree* thorow, in seuerall places, and thrust into the Places bored, Wedges of some Hot *Trees*, as *Turpentine*, *Mastick-Tree*, *Guaiacum*, *Juniper*, &c. The Cause may be, for that Aduentive Heat doth cheare vp the Native Iuyce of the *Tree*.

It is reported, that *Trees* will grow greater, and beare better *Fruit*, if you put *Salt*, or *Lees* of *Wine*, or *Blond* to the *Root*. The Cause may be the Encreasing the Lust or Spirit of the *Root*; These Things being more forcible, than ordinary *Composts*.

It is reported by one of the Ancients, that *Artichokes* will be lesse prickly, and more tender, if the *Seeds* haue their Tops dulled, or grated off vpon a *Stone*.



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*Herbs* will be tenderer, and fairer; if you take them out of *Beds*, when they are newly come up, and remove them into *Pots*, with better *Earth*. The Remove from *Bed* to *Bed* was spoken of before; But that was in severall yeeres; This is upon the sudden. The Cause is the same with other *Removes*, formerly mentioned.

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*Coleworts* are reported by one of the *Ancients*, to prosper exceedingly, and to be better tasted, if they be sometimes watered with *Salt-water*; And much more with *Water* mixed with *Nitre*; The Spirit of which is lesse Adurent than *Salt*.

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It is reported that *Cucumbers* will prove more Tender, and Dainty, if their *Seeds* be *Steeped* (a little) in *Milke*; The Cause may be, for that the *Seed* being mollified with the *Milke*, will be too weak to draw the grosser Iuyce of the *Earth*, but onely the finer. The same Experiment may be made in *Artichokes*, and other *Seeds*, when you would take away, either their *Flashinesse*, or *Bitternesse*. They speake also, that the like Effect followeth, of *Steeping* in *Water* mixed with *Honey*; But that seemeth to me not so probable, because *Honey* hath too quicke a Spirit.

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It is reported that *Cucumbers* will be lesse Watry, and more *Melon-like*, if in the Pit where you set them, you fill it (halfe way up) with *Chaffe*, or small *Sticks*, and then powre *Earth* upon them; For *Cucumbers*, as it seemeth, doe extremely affect *Moisture*; And over-drinke themselves; Which this *Chaffe*, or *Chips*, forbiddeth. Nay, it is further reported, that if when a *Cucumber* is growne, you set a Pot of water about five or six inches distance from it, it will, in 24. houres, shoot so much out, as to touch the Pot; Which if it be true, it is an Experiment of an higher Nature, than belongeth to this Title: For it discovereth *Perception* in *Plants*, to move towards that which should helpe and comfort them, though it be at a distance. The ancient Tradition of the *Vine* is far more strange: It is, that if you set a Stake, or Prop, some distance from it, it will grow that way; Which is farre stranger (as is said) than the other; For that *Water* may work by a *Sympathy* of *Attraction*: But this of the Stake seemeth to be a Reasonable Discourse.

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It hath beene touched before, that *Terebration* of *Trees* doth make them prosper better. But it is found also, that it maketh the *Fruit* sweeter, and better. The Cause is, for that notwithstanding the *Terebration*, they may receive Aliment sufficient; And yet no more than they can well turne, and digest; And withall doe sweat out the coursest and unprofitablest Iuyce; Even as it is in *Lining Creatures*, which by Moderate Feeding, and Exercise, and Sweat, attaine the soundest Habit of Body.

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As *Terebration* doth *Meliorate Fruit*, so, upon the like reason, doth *Letting* of *Plants Blood*; As *Pricking Vines*, or other *Trees*, after they bee of some Growth; And thereby letting forth *Gum*, or *Teares*; Though this be not to continue, as it is in *Terebration*, but at some Seasons. And it is reported, that by this Artifice, *Bitter Almonds* have beene turned into *Sweet*.

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The Ancients for the *Dulcorating* of *Fruit*, doe commend *Swines-Dung* aboue all other *Dung*; Which may be, because of the Moisture of that Beast, whereby the *Excrement* hath lesse Acrimony; For we see *Swines* and *Piggs* Flesh is the Moistest of Fleashes.

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It is obserued by some, that all *Herbs* wax sweeter, both in Smell and Taste, if after they be growne vp some reasonable time, they be cut, and so you take the latter Sprout. The *Cause* may be, for that the longer the Iuyce stayeth in the Root, and Stalke, the better it concocteth. For one of the Chiefe Causes, why *Grains*, *Seeds*, and *Fruits*, are more Nourishing than *Leaues*, is the Length of time, in which they grow to *Maturation*. It were not amisse to keepe backe the Sap of *Herbs*, or the like, by some fit meanes, till the end of Summer; whereby (it may be) they will be more Nourishing.

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As *Grafting* doth generally aduance and *Meliorate Fruits*, aboue that which they would bee, if they were set of *Kernels*, or *Stones*, in regard the *Nourishment* is better concocted; So (no doubt) euen in *Grafting*, for the same cause the Choise of the *Stocke* doth much; Alwaies provided, that it be somewhat inferiour to the *Cions*: For otherwise it dul- leth it. They commend much the *Grafting* of *Peares*, or *Apples*, vpon a *Quince*.

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Besides the *Meanes* of *Melioration* of *Fruits*, before mentioned, it is set downe as tryed, that a *Mixture* of *Bran*, and *Swines-Dung*; Or *Chaffe* and *Swines-Dung*; (especially laid vp together for a Moneth to rot,) is a very great Nourisher, and Comforter to a *Fruit-Tree*.

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It is deliuered, that *Onions* wax greater, if they be taken out of the Earth, and laid a drying twenty daies, and then set againe; And yet more, if the outermost Pill be taken off all ouer.

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It is deliuered by some, that if one take the *Bough* of a *Low Fruit-Tree*, newly budded, and draw it gently, without hurting it, into an *Earthen Pot* perforate at the bottome to let in the *Plant*, and then Co- uer the *Pot* with Earth, it will yeeld a very large *Fruit*, within the Ground. Which *Experiment* is Nothing but *Potting* of *Plants*, without Remouing, and Leauing the *Fruit* in the Earth. The like, (they say,) will be effected, by an Empty *Pot* without Earth in it, put ouer a *Fruit*, being propped vp with a *Stake*, as it hangeth vpon the *Tree*; And the better, if some few Pertusions be made in the *Pot*. Wherein, besides the Defending of the *Fruit*, from Extremity of Sunne or Weather, some giue a reason, that the *Fruit*, Louing and Coueting the o- pen Aire and Sunne, is inuited by those Pertusions, to spread and approach, as neere the open Aire, as it can; And so enlargeth in *Mag- nitude*.

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All *Trees* in *High* and *Sandy Grounds*, are to be set deepe; And in *Wa- try Grounds*, more shallow. And in all *Trees*, when they be remoued (espe- cially *Fruit-Trees*) care ought to be taken, that the Sides of the *Trees* be coasted, (*North* and *South*, &c.) as they stood before. The same is said also of *Stone* out of the *Quarry*, to make it more durable; Though that

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seemeth to haue lesse reason; Because the *Stone* lyeth not so neere the *Sunne*, as the *Tree* groweth.

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*Timber Trees* in a *Coppice Wood*, doe grow better, than in an *Open Field*; Both because, they offer not to spread so much, but shoot vp still in Height; And chiefly because they are defended from too much Sun and Wind, which doe checke the Growth of all *Fruit*; And so (no doubt) *Fruit-Trees*, or *Vines*, set vpon a *Wall*, against the *Sunne*, betweene Elbowes or Buttresses of *Stone*, ripen more, than vpon a *Plaine Wall*.

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It is said, that if *Potado Roots*, be set in a *Pot* filled with *Earth*, and then the *Pot* with *Earth* be set likewise within the *Gound*, some two or three Inches, the *Roots* will grow greater, than Ordinary. The Cause may be, for that *Hauing Earth* enough within the *Pot* to nourish them; And then being stopped by the *Bottom* of the *Pot* from putting *Strings* downward, they must needs grow greater in *Breadth* and *Thicknesse*. And it may be, that all *Seeds*, or *Roots*, *Potted*, and so set into the *Earth*, will prosper the better.

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The Cutting off the *Leaues* of *Radish*, or other *Roots*, in the beginning of *Winter*, before they wither; And Couering againe the *Root*, something high with *Earth*; Will preserue the *Root* all *Winter*, and make it bigger, in the *Spring* following, as hath beene partly touched before. So that there is a double Vse of this Cutting off the *Leaues*: For in *Plants*, where the *Root* is the *Esculent*, as *Radish*, and *Parsnips*, it will make the *Root* the greater: And so it will doe to the *Heads* of *Onions*. And where the *Fruit* is the *Esculent*, by Strengthening the *Root*, it will make the *Fruit* also the greater.

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It is an Experiment of great pleasure, to make the *Leaues* of *Shady Trees*, larger than ordinary. It hath beenetried (for certaine) that a *Cions* of a *Weech-Elme*, grafted vpon the *Stocke* of an Ordinary *Elme*, will put forth *Leaues*, almost as broad as the *Brimme* of ones *Hat*. And it is very likely, that as in *Fruit-Trees*, the *Graft* maketh a greater *Fruit*; So in *Trees* that beare no *Fruit*, it will make the greater *Leaues*. It would be tryed therefore in *Trees* of that kinde chiefly; As *Birch*, *Asp*, *Willow*; And especially the *Shining Willow*, which they call *Swallow-Taile*, because of the pleasure of the *Leafe*.

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The *Barrennesse* of *Trees*, by *Accident*, (besides the *Weaknesse* of the *Soile*, *Seed*, or *Root*; And the *Iniury* of the *Weather*) commeth either of their *Over-growing* with *Mosse*; Or their being *Hide-bound*; Or their *Planting too deepe*; Or by *Issuing* of the *Sap too much* into the *Leaues*. For all these there are *Remedies* mentioned before.

Experiments  
in Consort,  
touching Com-  
pound Fruits  
and Flowers.

Wee see that in *Liuing Creatures*, that haue *Male* and *Female*, there is *Copulation* of seuerall *Kinds*; And so *Compound Creatures*; As the *Mule*, that is generated betwixt the *Horse* and the *Asse*; And some other *Compounds*, which wee call *Monsters*,



sters, though more rare : And it is held, that that *Prouerbe*, *Africa semper aliquid Monstri parit*; commeth, for that the Fountaines of Waters there, being rare, diuers sorts of Beasts come from seuerall Parts to drinke; And so being refreshed, fall to couple, and many times with seuerall Kinds. The *Compounding* or *Mixture* of *Kinds* in *Plants* is not found out; Which neuerthelesse, if it be possible, is more at command, than that of *living Creatures*; For that their Lust requireth a voluntary Motion: wherefore it were One of the most Noble *Experiments* touching *Plants*, to finde it out: For so you may haue great Variety of New *Fruits*, and *Flowers* yet vnknowne. *Grafting* doth it not: That mendeth the *Fruit*, or doubleth the *Flowers*, &c. But it hath not the Power to make a New *Kinde*. For the *Cions* euer ouer-ruleth the *Stocke*.

It hath beene set downe by one of the *Ancients*, that if you take two *Twigs* of seuerall *Fruit Trees*, and flat them on the Sides, and then binde them close together, and set them in the ground, they will come vp in one *Stocke*; But yet they will put forth their seuerall *Fruits*, without any *Commixture* in the *Fruit*. Wherein note (by the way) that *Vnity* of *Continuance*, is easier to procure, than *Vnity* of *Species*. It is reported also, that *Vines* of *Red* and *White Grapes*, being set in the Ground, and the vpper Parts being flatted, and bound close together, will put forth *Grapes* of the seuerall Colours, vpon the same Branch; And *Grape Stones* of seuerall Colours within the same *Grape*: But the more, after a yeere or two; The *Vnity* (as it seemeth) growing more Perfect. And this will likewise helpe, if from the first *Vniting*, they be often Watred; For all Moisture helpeth to *Vnion*. And it is prescribed also, to binde the *Bud*, as soone as it commeth forth, as well as the *Stocke*; At the least for a time.

They report, that diuers *Seeds*, put into a *Clout*, and laid in Earth well dunged, will put vp *Plants* *Contiguous*; Which (afterwards) being bound in, their *Shoots* will *Incorporate*. The like is said of *Kernels*, put into a *Bottle*, with a Narrow Mouth, filled with Earth.

It is reported, that young *Trees* of seuerall kinds, set contiguous, without any binding, and very often Watred, in a *Fruitfull Ground*, with the very Luxury of the *Trees*, will incorporate, and grow together. Which seemeth to me the likeliest Meanes, that hath beene propounded; For that the *Binding* doth hinder the Naturall Swelling of the *Tree*; which, while it is in Motion, doth better *vnite*.

There are many Ancient and Receiued Traditions, and Obseruations, touching the *Sympathy* and *Antipathy* of *Plants*:

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Experiments  
in Consort  
touching the  
*Sympathy* and  
*Antipathy* of  
*Plants*.



For that some will thrive best growing neere others; which they impute to *Sympathy*: And some worse; which they impute to *Antipathy*. But these are Idle and Ignorant Conceits; And forsake the true *Indication* of the *Causes*; As the most Part of *Experiments*, that concerne *Sympathies* and *Antipathies* doe. For as to *Plants*, neither is there any such Secret *Friendship*, or *Hatred*, as they imagine; And if we should be content to call it *Sympathy*, and *Antipathy*, it is utterly mistaken; For their *Sympathy* is an *Antipathy*, and their *Antipathy* is a *Sympathy*: For it is thus; Wheresoever one *Plant* draweth such a particular Iuyce out of the Earth; as it qualifieth the Earth; So as that Iuyce which remaineth is fit for the other *Plant*, there the Neighbourhood doth good; Because the Nourishments are contrary, or severall: But where two *Plants* draw (much) the same Iuyce, there the Neighbourhood hurteth; For the one deceiveth the other.

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First therefore, all *Plants* that doe draw much *Nourishment* from the Earth, and so soake the Earth, and exhaust it; hurt all Things that grow by them; As Great *Trees*, (especially *Asbes*) and such *Trees*, as spread their *Roots*, neere the Top of the Ground. So the *Colewort* is not an Enemy (though that were anciently received) to the *Vine* onely; But it is an Enemy to any other *Plant*; Because it draweth strongly the fattest Iuyce of the Earth. And if it be true, that the *Vine*, when it creepeth neere the *Colewort*, will turne away; This may be, because there it findeth worse Nourishment; For though the *Root* be where it was, yet (I doubt) the *Plant* will bend as it nourisheth.

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Where *Plants* are of severall Natures, and draw severall Iuyces out of the Earth, there (as hath beene said) the One set by the other helpeth: As it is set downe by diuers of the Ancients, that *Rew* doth prosper much, and becommeth stronger, if it be set by a *Figge-Tree*: which (we conceiue) is caused, Not by Reason of *Friendship*, but by *Extraction* of a Contrary Iuyce: The one Drawing Iuyce fit to result Sweet, the other bitter. So they haue set downe likewise, that a *Rose* set by *Garlicke* is sweeter: Which likewise may be, because the more Fetide Iuyce of the Earth goeth into the *Garlick*; And the more Odorate into the *Rose*.

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This wee see manifestly, that there be certaine *Corne-Flowers*, which come seldome or neuer in other places, vnlesse they bee set; But onely amongst *Corne*: As the *Blew-Bottle*, a kinde of *Yellow Mary-Gold*, *Wilde Poppy*, and *Fumitory*. Neither can this bee, by Reason of the Culture of the Ground, by Plowing, or Furrowing; As some *Herbs*, and *Flowers*, will grow but in *Ditches* new Cast; For if the *Ground* lie fallow, and vnplowne, they will not come: So as it should seeme to be the *Corne*, that



that qualifieth the Earth, and prepareth it for their Growth.

This Obseruation, if it holdeth, (as it is very probable,) is of great vse, for the *Meliorating of Taste in Fruits, and Esculent Herbs; And of the Sent of Flowers.* For I doe not doubt, but if the *Figge-Tree* doe make the *Rew* more strong, and bitter, (as the Ancients haue noted,) good store of *Rew* planted about the *Fig-Tree*, will make the *Fig* more sweet. Now the *Tastes* that doe most offend in *Fruits, and Herbs, and Roots,* are *Bitter; Harsh; Sowre; And Watrish, or Flasby.* It were good therefore to make the *Trialls* following.

Take *Wormewood, or Rew,* and set it neare *Lettuce, or Coleflory, or Artichooke;* And see whether the *Lettuce, or the Coleflory, &c.* become not the sweeter.

Take a *Sernice-Tree, or a Cornelian-Tree, or an Elder-Tree,* which wee know haue *Fruits* of harsh and binding Iuyce, and set them neare a *Vine, or Figge-Tree,* and see whether the *Grapes, or Figges,* will not be the sweeter.

Take *Cucumbers, or Pumpions,* and set them (here and there) amongst *Muske-Melons,* and see whether the *Melons* will not be more Winny, and better tasted. Set *Cucumbers* (likewise) amongst *Radish,* and see whether the *Radish* will not be made the more Biting.

Take *Sorrell,* and set it amongst *Raspes,* and see whether the *Rasps* will not be the sweeter.

Take *Common Briar,* and set it amongst *Violets, or Wall-Flowers,* and see whether it will not make the *Violets, or Wall-Flowers* sweeter, and lesse Earthy in their Smell. So set *Lettuce, or Cucumbers,* amongst *Rosemary, or Bayes,* and see whether the *Rosemary, or Bayes,* will not be the more Odorate, or Aromaticall.

Contrariwise, you must take heed, how you set *Herbs* together, that draw much the like Iuyce. And therefore I thinke *Rosemary* will leese in Sweetnesse, if it be set with *Laender, or Bayes, or the like.* But yet, if you will correct the strength of an Herbe, you shall doe well to set other like Herbs by him, to take him downe; As if you should set *Tansy* by *Angelica,* it may be, the *Angelica* would be the weaker, and fitter for Mixture in Perfume. And if you should set *Rew* by *Common Wormewood,* it may be, the *Wormewood* would turne to be liker *Roman Wormewood.*

This *Axiome* is of large extent; And therefore would be seuered, and refined by *Triall.* Neither must you expect to haue a *Grosse Difference* by this kinde of Culture, but only *Further Perfection.*

*Triall* would be also made in *Herbs Poisonous, and Purgative,* whose ill Qualitie (perhaps) may be discharged, or attempred, by Setting stronger *Poisons, or Purgatives,* by them.

It is reported, that the *Shrub* called *Our Ladies Seale,* (which is a Kinde of *Briony,*) and *Coleworts,* set neere together, one or both will die. The *Cause* is, for that they be both great Depredatours of the Earth, and one of them starueth the other. The like is said of a *Reed,* and a *Brake;* Both which are succulent; And therefore the One de-  
ceiueth

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ceiueth the Other. And the like of *Hemlocke* and *Rew*; Both which draw strong Iuyces.

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Some of the Ancients, and likewise diuers of the Moderne Writers, that haue laboured in *Naturall Magick*, haue noted a *Sympathy*, betweene the *Sunne*, *Moone*, and some Principall *Starres*; And certaine *Herbs*, and *Plants*. And so they haue denominated some *Herbes Solar*, and some *Lunar*; And such like Toyes put into great Words. It is manifest, that there are some *Flowers*, that haue *Respect* to the *Sunne*, in two *Kindes*; The one by *Opening* and *Shutting*; And the other by *Bowing* and *Inclining* the *Head*. For *Mary-golds*, *Tulippa's*, *Pimpernell*, and indeed most *Flowers*, doe open or spread their *Leaues* abroad, when the *Sunne* shineth serene and faire: And againe, (in some part,) close them, or gather them inward, either towards *Night*, or when the *Skie* is ouercast. Of this there needeth no such Solemne Reason to be assigned; As to say, that they reioyce at the Presence of the *Sunne*; And mourne at the Absence thereof. For it is Nothing else, but a little Loading of the *Leaues*, and Swelling them at the *Bottom*, with the *Moisture* of the *Aire*; whereas the drie *Aire* doth extend them: And they make it a Peece of the wonder, that *Garden Clauer* will hide the *Stalke*, when the *Sunne* sheweth bright; Which is Nothing, but a full Expansion of the leaues. For the *Bowing* and *Inclining* the *Head*; it is found in the great *Flower* of the *Sunne*; in *Mary-golds*; *Wart-wort*; *Mallow Flowers*; and others. The *Cause* is somewhat more Obscure than the former; But I take it to be no other, but that the Part against which the *Sunne* beateh, waxeth more faint and flaccide in the *Stalke*; And thereby lesse able to support the *Flower*.

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What a little *Moisture* will doe in *Vegetables*, euen though they be dead, and seuered from the *Earth*, appeareth well in the *Experiment* of *Juglers*. They take the *Beard* of an *Oate*; which (if you marke it well,) is wreathed at the *Bottom*, and one smooth entire *Straw* at the *Top*. They take only the Part that is Wreathed, and cut off the other, leauing the *Beard* halfe the Breadth of a finger in length. Then they make a little *Crosse* of a *Quill*, long-wayes of that Part of the *Quill*, which hath the *Pith*, And *Crosse-wayes* of that peece of the *Quill* without *Pith*; The whole *Crosse* being the Breadth of a Finger high. Then they pricke the *Bottom* where the *Pith* is, and thereinto they put the *Oaten-beard*, leauing halfe of it sticking forth of the *Quill*: Then they take a little white Box of wood, to deceiue Men, as if somewhat in the Box did worke the *Feat*: In which, with a Pinne, they make a little Hole, enough to take the *Beard*, but not to let the *Crosse* sinke downe, but to sticke. Then likewise by way of *Imposture*, they make a *Question*; As, Who is the Fairest Woman in the Company? Or, Who hath a Gloue, or Card? And cause another to name diuers Persons: And vpon euery Naming, they sticke the *Crosse* in the Box, hauing first put it towards their Mouth, as if they charmed it; And the *Crosse* stirreth not; But when they come to the Person that they would take; As they hold the *Crosse* to their mouth, they



they touch the *Beard* with the Tip of their Tongue, and wet it; And so sticke the *Crosse* in the Box; And then you shall see it turne finely and softly, three or foure Turnes; Which is caused by the vntwining of the *Beard* by the Moisture. You may see it more euidently, if you sticke the *Crosse* betweene your fingers, in Stead of the Box; And therefore you may see, that this Motion, which is effected by so little Wer, is stronger than the Closing or Bending of the Head of a *Marigold*.

It is reported by some, that the *Herbe* called *Rosa-Solis*, (whereof they make Strong Waters,) will at the Noone-day, when the *Sunne* shineth hot and bright, haue a great Dew vpon it. And therefore, that the right Name is *Ros Solis*: which they impute to a Delight and *Sympathy*, that it hath with the *Sunne*. Men fauour Wonders. It were good first to be sure, that the Dew that is found vpon it, be not the Dew of the Morning Preserued, when the Dew of other *Herbs* is breathed away; for it hath a smooth and thicke Lease, that doth not discharge the Dew so soone, as other *Herbes* that are more Spungie and Porous. And it may be *Purflane*, or some other *Herbe*, doth the like, and is not marked. But if it be so, that it hath more Dew at Noone, than in the Morning, then sure it seemeth to be an Exudation of the *Herbe* it selfe. As Plums sweat when they are set into the Ouen: for you will not (I hope) thinke, that it is like *Gedeons Fleece of Wooll*, that the Dew should fall vpon that, and no where else.

It is certaine, that the *Honey-dewes* are found more vpon *Oake-leaves*, than vpon *Ash*, or *Beech*, or the like: But whether any Cause be, from the Lease it selfe, to concoct the Dew; Or whether it be only, that the Lease is Close and Smooth; (And therefore drinketh not in the Dew, but preserueth it;) may be doubted. It would be well inquired, whether *Manna the Drug*, doth fall but vpon certaine *Herbes* or *Leaves* only. *Flowers* that haue deepe *Sockets*, doe gather in the Bottome, a kinde of *Honey*; As *Honey-Suckles*; (both the *Woodbine*, and the *Trifoile*;) *Lillies*; and the like. And in them certainly the *Flower* beareth part with the Dew.

The Experience is, that the *Froth*, which they call *Woodseare*, (being like a kinde of Spittle,) is found but vpon certaine *Herbs*, and those Hot Ones; As *Lauender*, *Lauender-cotton*, *Sage*, *Hissope*, &c. Of the Cause of this enquire further; For it seemeth a Secret. There falleth also *Mildew* vpon *Corne*, and smutteth it; But it may be, that the same falleth also vpon other *Herbs*, and is not obserued.

It were good, Triall were made, whether the great Consent betweene *Plants* and *Water*, which is a principall Nourishment of them, will make an *Attraction* or Distance, and not at Touch only. Therefore take a *Vessell*, and in the middle of it make a false Bottome of course Canuasse: Fill it with Earth about the Canuasse, and let not the Earth be watted; Then sow some good *Seeds* in that Earth; But vnder the Canuasse, some halfe a foot in the Bottome of the Vessell, lay a great *Sponge*, thorowly wet in water; And let it lye so some ten Dayes; And see

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Experiments  
in Confort,  
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Making Herbs  
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dicinable.

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see whether the *Seeds* will sprout, and the *Earth* become more Moist, and the *Sponge* more drie. The *Experiment* formerly mentioned of the *Cucumber*, creeping to the Pot of Water, is farre stranger than this.

**T**He *Altering* of the *Sent*, *Colour*, or *Taste* of *Fruit*, by *Infusing*, *Mixing*, or *Letting* into the *Barke*, or *Root* of the *Tree*, *Herbe*, or *Flower*, any *Coloured*, *Aromaticall*, or *Medicinall* Substance; are but *Fancies*. The *Cause* is, for that those Things haue passed their Period, and nourish not. And all *Alteration* of *Vegetables*, in those *Qualities*, must be by somewhat, that is apt to goe into the *Nourishment* of the *Plant*. But this is true; that where *Kine* feed vpon *Wilde Garlicke*, their *Milke* tasteth plainly of the *Garlicke*: And the *Flesh* of *Muttons* is better tasted where the *Sheepe* feed vpon *Wilde Thyme*, and other wholesome *Herbs*. *Galen* also speaketh of the *Curing* of the *Scirrhus* of the *Liner*, by *Milke* of a *Cow*, that feedeth but vpon certaine *Herbs*; And *Honey* in *Spaine* smelleth (apparently) of the *Rosemary*, or *Orange*, from whence the *Bee* gathereth it: And there is an old Tradition of a *Mayden* that was fed with *Napellus*; (which is counted the Strongest Poyson of all *Vegetables*; ) which with vse did not hurt the *Maid*, but poisoned some that had Carnall Company with her. So it is obserued by some, that there is a vertuous *Bezoar*, and another without vertue; which appeare to the shew alike; But the Vertuous is taken from the Beast, that feedeth vpon the Mountaines, where there are *Theriackall Herbs*; And that without Vertue, from those that feed in the Valleyes, where no such *Herbes* are. Thus farre I am of Opinion; That as Steeped Vvines and Beeres, are very *Medicinall*; and likewise Bread tempered with diuers Powders; So of *Meat* also (as *Flesh*, *Fish*, *Milke*, and *Egges*,) that they may be made of great vse for *Medicine*, and *Diet*, if the *Beasts*, *Fowle*, or *Fish*, be fed with a speciall kinde of food fit for the Disease. It were a dangerous Thing also for secret Em-poysonments. But whether it may be applyed vnto *Plants*, and *Herbs*, I doubt more; Because the *Nourishment* of them is a more common Iuyce; which is hardly capable of any speciall Qualitie, vntill the *Plant* doe assimilate it.

But lest our Incredulity may preiudice any profitable Operations in this kind, (especially since Many of the Ancients haue set them down,) We thinke good briefly to propound the foure *Meanes*, which they haue deuised of Making *Plants Medicinable*. The First is by *Slitting* of the *Root*, and *Infusing* into it the *Medicine*; As *Hellebore*, *Opium*, *Scammony*, *Triacle*, &c. And then binding it vp againe. This seemeth to me the least probable; Because the *Root* draweth immediately from the *Earth*; And so the *Nourishment* is the more Common, and lesse Qualified: And besides it is a long time in Going vp, ere it come to the *Fruit*. The Second way is, to *Perforate* the *Body* of the *Tree*, and there to *Infuse* the *Medicine*: Which is somewhat better: For if any Vertue be receiued from the *Medicine*, it hath the lesse way, and the lesse time, to goe vp. The Third is, the *Steeping* of the *Seed* or *Kernell* in some *Liquor*, where-

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in the *Medicine* is *Infused*: which I haue little Opinion of, because the *Seed* (I doubt,) will not draw the Parts of the *Master*, which haue the *Propriety*: But it will bee farre the more likely, if you mingle the *Medicine* with *Dung*; For that the *Seed* naturally drawing the *Moisture* of the *Dung*, may call in withall some of the *Propriety*. The fourth is, the *Watring* of the *Plant* oft, with an *Infusion* of the *Medicine*. This, in one respect, may haue more force than the rest; Because the *Medication* is oft renewed; Whereas the rest are applyed but at one time: And therefore the *Vertue* may the sooner vanish. But still I doubt, that the *Root* is somewhat too stubborne to receiue those fine *Impressions*; And besides, (as I said before,) they haue a great *Hill* to goe vp. I iudge therefore the likeliest way to be the *Perforation* of the *Bodie* of the *Tree*, in *seuerall Places*, one above the other; And the *Filling* of the *Holes* with *Dung mingled with the Medicine*.

And the *Watring* of those *Lumpes* of *Dung*, with  
Squirts of an *Infusion* of the *Medicine* in  
*Dunged water*, once in three  
or foure *Dayes*.

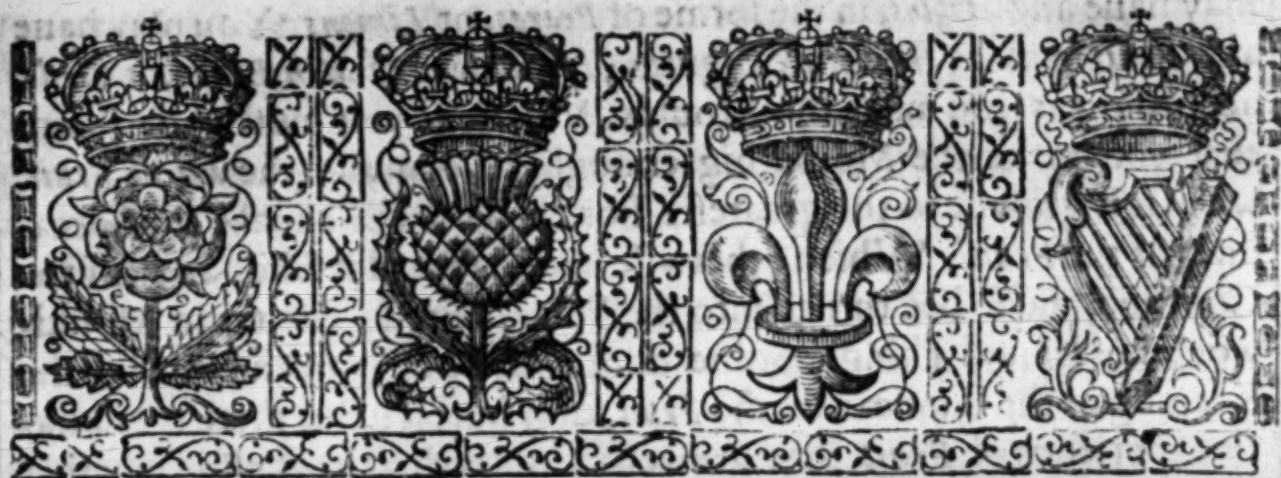
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in the Medicine is infused: which I have little Opinion of because the  
 Seed (I doubt) will not draw the Parts of the Matter, which have the  
 Property: But it will be farre the more likely, if you mingle the Me-  
 dicine with Dung; For that the Seed naturally drawing the Moisture of  
 the Dung, may call in withall some of the Property. The fourth is, the  
 Mixture of the Plant itself, with an infusion of the Medicine. This, in our  
 respect, may have more force than the rest; Because the Carduus is  
 oft renewed; Whereas the rest are applied but at one time. And  
 therefore the Virtue may the sooner vanish. But still I doubt, that  
 the Root is somewhat too stubborne to receive those fine Impregnations;  
 And besides, (as I said before) they have a great Hill to go up. I  
 judge therefore the likeliest way to be the Perforation of the Body  
 of the Tree, in several Places, one above the other; And the Fil-  
 ling of the Holes with Drug mingled with the Medicine.  
 And the Mixture of those Lumps of Dung, with  
 Spirits of an infusion of the Medicine in  
 Drawed water, once in three  
 or four Days.

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# NATVRALL HISTORIE.

## VI. Century.



*V R Experiments* we take care to be (as we haue often said) either *Experimenta Fructifera*, or *Lucifera*; Either of *Vse*, or of *Discouery*: For we hate *Impostures*; And despise *Curiosities*. Yet because we must apply our Selues somewhat to Others, we will set downe some *Curiosities* touching *Plants*.

It is a *Curiosity*, to haue *seuerall Fruits* vpon *one Tree*; And the more, when some of them come *Early*, and some come *Late*; So that you may haue vpon the same *Tree*, Ripe *Fruits* all Sommer. This is easily done, by Grafting of *seuerall Cions*, vpon *seuerall Boughes*, of a Stock, in a good Ground, plentifully fed. So you may haue all Kindes of *Cherries*, and all Kindes of *Plums*, and *Peaches*, and *Apricots*, vpon *one Tree*; But I conceiue the *Diuersity* of *Fruits* must be such, as will graft vpon the same Stocke. And therefore I doubt, whether you can haue *Apples*, or *Pears*, or *Oranges*, vpon the same Stocke, vpon which you graft *Plummes*.

It is a *Curiosity* to haue *Fruits* of *Diuers Shapes*, and *Figures*. This is easily performed by Moulding them, when the *Fruit* is young, with Moulds of Earth, or Wood. So you may haue *Cucumbers*, &c. as Long

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Experiments  
in Consort  
touching *Curiosities* about  
*Fruits* and  
*Plants*.

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as a Cane; Or as Round as a Spheare; Or formed like a Crosse. You may haue also *Apples*, in the forme of *Peares*, or *Lemons*. You may haue also *Fruit* in more Accurate Figures; As we said of *Men*, *Beasts*, or *Birds*, according as you make the Moulds. Wherein you must vnderstand, that you make the Mould big enough, to containe the whole *Fruit*, when it is growne to the greatest: For else you will choake the Spreading of the *Fruit*; Which otherwise would spread it selfe, and fill the Concaue, and so bee turned into the *Shape* desired; As it is in Mould-workes of Liquid Things. Some doubt may bee conceiued, that the Keeping of the Sunne from the *Fruit*, may hurt it: But there is ordinary experience of *Fruit* that groweth Couered. *Quare* also, whether some small Holes, may not be made in the Wood, to let in the Sunne. And note, that it were best to make the Moulds partible, glued, or cemented together, that you may open them, when you take out the *Fruit*.

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It is a *Curiosity*, to haue *Inscriptions*, or *Engrauings*, in *Fruit*, or *Trees*. This is easily performed, by *Writing* with a *Needle*, or *Bodkin*, or *Knife*, or the like, when the *Fruit*, or *Trees* are young; For as they grow, so the Letters will grow more large, and Graphicall.

——— *Tenerisq; meos incidere Amores*  
*Arboribus, crescent illa, crescetis Amores.*

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You may haue *Trees* apparelled with *Flowers*, or *Herbs*, by *Boring* *Holes* in the *Bodies* of them, and Putting into them *Earth* holpen with *Mucke*, and *Setting* *Seeds*, or *Slips*, of *Violets*, *Strawberries*, *Wilde-Thyme*, *Camomill*, and such like in the *Earth*. Wherein they doe but grow, in the *Tree*, as they doe in *Pots*; Though (perhaps) with some Feeding from the *Trees*. It would be tried also with *Shoots* of *Vines*, and *Roots* of *Red-Roses*; For it may be, they being of a more Ligneous Nature, will incorporate with the *Tree* it selfe.

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It is an ordinary *Curiosity*, to *Forme* *Trees* and *Shrubs*, (as *Rosemary*, *Iuniper*, and the like,) into *Sundry* *Shapes*; which is done by Moulding them within, and Cutting them without. But they are but lame Things, being too small to keepe Figure: Great *Castles* made of *Trees* vpon Frames of Timber, with Turrets, and Arches, were matters of Magnificence.

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Amongst *Curiosities*, I shall place *Colouration*, though it be somewhat better: For *Beauty* in *Flowers* is their Preheminence. It is obserued by some, that *Gilly-flowers*, *Sweet-Williams*, *Violets*, that are *Coloured*, if they be neglected, and neither Watered, nor New Moulded, nor Transplanted, will turne *White*. And it is probable, that the *White* with much culture, may turne *Coloured*. For this is certaine, that the *White* Colour cometh of Scarcity of Nourishment; Except in *Flowers* that are onely *White*, and admit no other Colours.

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It is good therefore, to see what *Natures* doe accompany what Colours; For by that you shall haue Light, how to induce Colours, by Producing those *Natures*. *Whites* are more Inodorate, (for the most part,) than



than *Flowers* of the same kinde *Coloured*; As is found in *Single White Violets*, *White-Roses*, *White Gilly-Flowers*, *White Stock-Gilly-Flowers*, &c. We finde also, that *Blossomes* of *Trees*, that are *White*, are commonly *Inodorate*; As *Cherries*, *Pears*, *Plummes*; Whereas those of *Apples*, *Crabs*, *Almonds*, and *Peaches*, are *Blushy*, and *Smell sweet*. The Cause is, for that the Substance that maketh the *Flower*, is of the thinnest and finest of the *Plant*; Which also maketh *Flowers* to be of so dainty *Colours*. And if it bee too *Sparing*, and *Thinne*, it attaineth no *Strength* of *Odour*; Except it be in such *Plants*, as are very *Succulent*; Whereby they need rather to be *scanted* in their *Nourishment*, than *replenished*, to haue them *sweet*. As we see in *White Satyrion*, which is of a *Dainty Smell*; And in *Beane-Flowers*, &c. And againe, if the *Plant* bee of *Nature*, to put forth *White Flowers* onely, and those not *thinne*, or *dry*, they are commonly of *rancke* and *sulfome Smell*; As *May-Flowers*, and *White Lillies*.

Contrariwise, in *Berries*, the *White* is commonly more *Delicate*, and *Sweet* in *Taste*, than the *Coloured*; As we see in *White Grapes*; In *White Raspes*; In *White Strawberries*; In *White Currans*, &c. The Cause is, for that the *Coloured* are more *iuyced*, and *courser iuyced*; And therefore not so well and equally *Concocted*; But the *White* are better proportioned, to the *Disgestion* of the *Plant*.

But in *Fruits*, the *White* commonly is *meaner*; As in *Pearre-Plums*, *Damasins*, &c. And the *Choicest Plummes* are *Blacke*; The *Mulberry*, (which though they call it a *Berry*, is a *Fruit*.) is better the *Blacke*, than the *White*. The *Harnest White-Plumme*, is a *base Plumme*; And the *Verdaccio* and *White Date-Plumme*, are no very good *Plummes*. The Cause is, for that they are all *Ouer-watry*. Whereas an higher *Concoction* is required for *Sweetnesse*, or *Pleasure* of *Taste*; And therefore all your dainty *Plummes*, are a little *dry*, and come from the *Stone*; As the *Muscle-Plumme*, the *Damasin-Plumme*, the *Peach*, the *Apricot*, &c. Yet some *Fruits*, which grow not to bee *Blacke*, are of the *Nature* of *Berries*, *sweetest* such as are *Paler*; As the *Cœur-Cherry*, which inclineth more to *White*, is *sweeter* than the *Red*; But the *Egriot* is more *soure*.

Take *Gilly Flower Seed*, of one kinde of *Gilly Flower*: (As of the *Cloue-Gilly-Flower*, which is the most *Common*;) And sow it; And there will come vp *Gilly Flowers*, some of one *Colour*, and some of another, casually, as the *Seed* meeteth with *Nourishment* in the *Earth*; So that the *Gardiners* finde, that they may haue two or three *Roots* amongst an hundred, that are rare, and of great *Price*: As *Purple*, *Carnation* of seuerall *Stripes*. The Cause is (no doubt) that in *Earth*, though it be *coniguous*, and in one *Bed*, there are very seuerall *Iuyces*; And as the *Seed* doth casually meet with them, so it cometh forth. And it is noted especially, that those which doe come vp *Purple*, doe alwaies come vp *Single*; The *Iuyce*, as it seemeth, not being able to suffice a *Succulent Colour*, and a *Double Lease*. This Experiment of seuerall Co-



*lours*, comming vp from one *Seed*, would be tried also in *Larkes-Foot*, *Monkes-Hood*, *Poppy*, and *Hollyoke*.

§11

Few *Fruits* are coloured *Red* within; The *Queene-Apple* is; And another *Apple*, called the *Rose-Apple*, *Mulberries* likewise; and *Grapes*, though most toward the *Skinne*. There is a *Peach* also, that hath a *Circle of Red* towards the *Stone*: And the *Egriot-Cherry* is somewhat *Red* within; But no *Peare*, nor *Warden*, nor *Plumme*, nor *Apricot*, although they haue (many times) *Red* sides, are Coloured *Red* within. The Cause may be enquired.

§12

The Generall Colour of *Plants* is *Greene*; which is a Colour that no *Flower* is of. There is a *Greenish Prime-Rose*, but it is *Pale* and scarce a *Greene*; The *Leaves* of some *Trees* turne a little *Murry*, or *Reddish*; And they be commonly *Young Leaves* that doe so; As it is in *Oakes*, and *Vines*, and *Hassle*. *Leaves* rot into a *Yellow*; And some *Hollies* haue part of their *Leaves Yellow*, that are, (to all seeming,) as *Fresh* and *Shining*, as the *Greene*. I suppose also, that *Yellow* is a lesse *Succulent Colour*, than *Green*; And a degree neerer *White*. For it hath beene noted, that those *Yellow Leaves* of *Holly* stand euer towards the *North*, or *North-East*. Some *Roots* are *Yellow*, as *Carrets*; And some *Plants Blond-Red*, *Stalke* and *Leafe*, and all; as *Amaranthus*. Some *Herbs* incline to *Purple*, and *Red*; As a Kinde of *Sage* doth, and a Kinde of *Mint*, and *Rosa Solis*, &c. And some haue *White Leaves*, as another Kinde of *Sage*, and another Kinde of *Mint*; But *Azure*, and a *Faire Purple*, are neuer found in *Leaves*. This sheweth, that *Flowers* are made of a *Refined Iuyce*, of the *Earth*; And so are *Fruits*: But *Leaves* of a more *Course*, and *Common*.

§13

It is a *Curiosity* also to make *Flowers Double*; Which is effected by often *Remouing* them into *New Earth*; As on the contrary Part, *Double Flowers*, by neglecting, and not *Remouing*, proue *Single*. And the Way to doe it speedily, is to sow or set *Seeds*, or *Slips of Flowers*; And as soone as they come vp, to remoue them into *New Ground*, that is good. Enquire also, whether *Inoculating of Flowers*, (as *Stock-Gilly-Flowers*, *Roses*, *Musk-Roses*, &c.) doth not make them *Double*. There is a *Cherry-Tree*, that hath *Double Blossomes*; But that *Tree* beareth no *Fruit*; And, it may be, that the same *Meanes*, which applied to the *Tree*, doth extremely accelerate the *Sap* to rise, and breake forth; Would make the *Tree* spend it selfe in *Flowers*, and those to become *Double*; Which were a great pleasure to see; Especially in *Apple-Trees*, *Peach-Trees*, and *Almond-Trees*, that haue *Blossomes Blush-Coloured*.

§14

The *Making of Fruits*, without *Core* or *Stone*, is likewise a *Curiosity*; And somewhat better: Because whatsoeuer maketh them so, is like to make them more *Tender* and *Delicate*. If a *Cione* or *Shoot*, fit to be set in the *Ground*, haue the *Pith* finely taken forth, (and not altogether, but some of it left, the better to saue the life,) it will beare a *Fruit* with little, or no *Core*, or *Stone*. And the like is said to bee, of diuiding a *Quick-Tree* downe to the *Ground*, and Taking out the *Pith*, and then binding it vp againe.



It is reported also, that a *Citron* grafted vpon a *Quince*, will haue small or no *Seeds*; And it is very probable, that any *Sowre Fruit*, grafted vpon a *Stock*, that beareth a *Sweeter Fruit*, may both make the *Fruit* sweeter, and more void of the harsh matter of *Kernels* or *Seeds*.

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It is reported, that not onely the *Taking out* of the *Pith*, but the *Stopping* of the *Iuyce* of the *Pith*, from Rising in the Middest, and *Turning* it to rise on the Outside, will make the *Fruit* without *Core*, or *Stone*; As if you should bore a *Tree* cleane thorow, and put a wedge in. It is true, there is some Affinity betweene the *Pith* and the *Kernell*, because they are both of a harsh Substance, and both placed in the Middest.

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It is reported, that *Trees* watered perpetually with *Warme Water*, will make a *Fruit*, with little or no *Core*, or *Stone*. And the Rule is generall, that whatsoever will make a *Wild-Tree* a *Garden-Tree*, will make a *Garden-Tree* to haue lesse *Core*, or *Stone*.

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**T**He Rule is certaine, that *Plants* for want of Culture, degenerate to be baser in the same Kinde; And sometimes so farre, as to change into another Kinde. 1. The *Standing long*, and not being *Remoued*, maketh them degenerate. 2. *Drought*, vnlesse the Earth of it selfe be moist, doth the like. 3. So doth *Remouing into worse Earth*, or *Forbearing to Compost the Earth*; As we see that *Water-Mint* turneth into *Field-Mint*; And the *Colewort* into *Rape* by Neglect, &c.

Experiments  
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of Plants; And  
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ther.

Whatsoever *Fruit* vseth to be set vpon a *Root*, or a *Slip*, if it be sowne, will degenerate. *Grapes* sowne; *Figs*, *Almonds*, *Pomgranate Kernels* sowne; make the *Fruits* degenerate, and become Wilde. And againe, Most of those *Fruits* that vse to be grafted, if they be set of *Kernels*, or *Stones*, degenerate. It is true, that *Peaches* (as hath beene touched before) doe better vpon *Stones* Set, than vpon *Grafting*: And the Rule of Exception should seeme to be this; That whatsoever *Plant* requireth much Moisture, prospereth better vpon the *Stone*, or *Kernell*, than vpon the *Graft*. For the *Stocke*, though it giueth a finer Nourishment, yet it giueth a scantier, than the Earth at large.

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*Seeds*, if they be very *Old*, and yet haue strength enough to bring forth a *Plant*, make the *Plant* degenerate. And therefore skilfull Gardiners make triall of the *Seeds*, before they buy them, whether they be good or no, by Putting them into Water gently Boiled; And if they be good, they will sprout within Halfe an Houre.

520

It is strange which is reported, that *Basil* too much exposed to the *Sunne*, doth turne into *Wilde Thyme*: Although those two *Herbs* seeme to haue small Affinity; but *Basil* is almost the only Hot *Herbe*, that hath Fat and Succulent *Leaves*; Which Oyliness, if it be drawne forth by the *Sunne*, it is like it will make a very great Change.

521

There is an old Tradition, that *Boughs of Oake*, put into the Earth, will put forth *Wilde Vines*: Which if it be true (no doubt) it is not the *Oake* that turneth into a *Vine*, but the *Oake-Bough* Putrifying, qualifieth the Earth, to put forth a *Vine* of it selfe.

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It is not impossible, and I haue heard it verified, that vpon *Cutting* downe of an Old *Timber-Tree*, the *Stub* hath put out sometimes a *Tree* of another *Kinde*; As that *Beech* hath put forth *Birch*; Which, if it bee true, the *Cause* may be, for that the old *Stub* is too scant of Iuyce, to put forth the former *Tree*; And therefore putteth forth a *Tree* of a smaller kinde, that needeth lesse Nourishment.

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There is an Opinion in the Countrey, that if the same *Ground* be *ofsowne*, with the *Graine* that grew *upon* it, it will in the end, grow to be of a baser kinde.

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It is certaine, that in very *Sterile* *Teeres*, *Corne* sowne will grow to an *Other Kinde*.

*Grandia sapè quibus mandauimus Hordea Sulcis,*

*Infelix Lolium, & steriles dominantur Aenea.*

And generally it is a Rule, that *Plants*, that are brought forth by *Culture*, as *Corne*, will sooner change into other *Species*, than those that come of themselves: For that *Culture* giueth but an *Aduentitious* Nature, which is more easily put off.

This worke of the *Transmutation* of *Plants*, one into another, is *inter Magnalia Naturæ*: For the *Transmutation* of *Species* is, in the vulgar Philosophy, pronounced Impossible: And certainly, it is a thing of difficultie, and requireth deepe Search into Nature: But seeing there appeare some manifest *Instances* of it, the Opinion of Impossibility is to be reiected; And the *Meanes* thereof to bee found out. Wee see, that in *Liuing Creatures*, that come of *Putrefaction*, there is much *Transmutation*, of one into another; As *Catterpillars* turne into *Flies*, &c. And it should seeme probable, that whatsoeuer *Creature*, hauing life, is generated without *Seed*, that *Creature* will change out of one *Species* into another. For it is the *Seed*, and the Nature of it, which locketh and boundeth in the *Creature*, that it doth not expatiate. So as we may well conclude, that seeing the Earth, of it selfe, doth put forth *Plants*, without *Seed*, therefore *Plants* may well haue a *Transmigration* of *Species*. Wherefore wanting *Instances*, which doe occurre, wee shall giue *Directions* of the most likely *Trialls*: And generally, we would not haue those, that read this our Worke of *Sylua Sylvarum*, account it strange, or thinke that it is an *Ouer-Haste*, that wee haue set downe *Particulars* vntried; For contrariwise, in our owne Estimation, we account such *Particulars*, more worthy, than those that are already



ready tried and knowne. For these Later must be taken as you finde them; But the Other doe leuell Point blanke at the *Inuenting of Causes, and Axiomes.*

First therefore you must make account, that if you will haue one *Plant* change into another, you must haue the *Nourishment* over-rule the *Seed*; And therefore you are to practise it by *Nourishments* as contrary, as may be, to the *Nature* of the *Herbe*; So neuertheless as the *Herbe* may grow; And likewise with *Seeds* that are of the Weakest Sort, and haue least Vigour. You shall doe well therefore, to take *Marsh-Herbs*, and Plant them vpon Tops of Hills, and Champaignes; And such *Plants* as require much Moisture, vpon Sandy and very dry Grounds. As for Example, *Marsh-Mallows*, and *Sedge*, vpon Hills; *Cucumber* and *Lettuce-Seeds*, and *Coleworts*, vpon a *Sandy Plot*: So contrariwise plant *Bushes*, *Heath*, *Ling*, and *Brakes*, vpon a *Wet* or *Marsh Ground*. This I conceiue also, that all *Esculent* and *Garden-Herbs*, set vpon the Tops of Hills, will proue more *Medicinall*, though lesse *Esculent*, than they were before. And it may be likewise, some *Wilde-Herbs* you may make *Sallet-Herbs*. This is the first Rule for *Transmutation of Plants*.

The second Rule shall be to bury some few *Seeds*, of the *Herbe* you would change, amongst other *Seeds*; And then you shall see, whether the Iuyce of those other *Seeds*, doe not so qualifie the Earth, as it will alter the *Seed*, whereupon you worke. As for Example; Put *Parsly-Seed* amongst *Onion-Seed*; Or *Lettuce-Seed* amongst *Parsly-Seed*; Or *Basil-Seed* amongst *Thyme-Seed*; And see the Change of Taste, or other wise. But you shall doe well, to put the *Seed* you would change, into a little linnen Cloth, that it mingle not with the forraine *Seed*.

The third Rule shall be, the *Making* of some *Medley* or *Mixture* of *Earth*, with some other *Plants* bruised, or *Shawen*, either in *Leafe* or *Root*: As for Example, make *Earth* with a *Mixture* of *Colewort-Leaves*, stamped, and set in it *Artichokes*, or *Parasnips*; So take *Earth* made with *Maioram*, or *Origanum*, or *Wilde-Thyme*, bruised, or stamped, and set in it *Fennell-Seed*, &c. In which Operation, the Proesse of Nature still will be, (as I conceiue) not that the *Herbe* you worke vpon, should draw the Iuyce of the Forraine *Herbe*; (For that Opinion we haue formerly reiecte;) But that there will be a New Confection of Mould, which perhaps will alter the *Seed*, and yet not to the kinde of the former *Herbe*.

The fourth Rule shall be, to marke what *Herbs*, some *Earths* doe put forth of themselues; And to take that *Earth*, and to Pot it, or to Vessell it; And in that to set the *Seed* you would change: As for example, take from vnder Walls, or the like, where *Nettles* put forth in abundance, the *Earth* which you shall there finde, without any *String*, or *Root* of the *Nettles*; And Pot that *Earth*, and set in it *Stock-gilly-flowers*, or *Wall-Flowers*, &c. Or sow in the *Seeds* of them; And see what the Euent will be: Or take *Earth*, that you haue prepared to put forth *Mush-*  
romes,

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comes, of it selfe, (whereof you shall finde some *Instances* following;) And sow in it *Purslane-Seed*, or *Lettuce-Seed*; For in these *Experiments*, it is likely enough, that the earth being accustomed to send forth one Kinde of Nourishment, will alter the new *Seed*.

530

The fifth Rule shall be, to make the *Herbe* grow *contrary* to his *Nature*; As to make *Ground-Herbs* rise in *Height*: As for example; Carry *Camomill*, or *Wilde-Thyme*, or the *Greene Strawberry*, vpon *Sticke*s, as you doe *Hops* vpon *Poles*; and see what the *Euent* will be.

531

The sixth Rule shall be, to make *Plants* grow out of the *Sunne*, or *Open Aire*; For that is a great *Mutation* in *Nature*; And may induce a *Change* in the *Seed*: As barrell vp *Earth*, and sow some *Seed* in it, and put it in the *Bottom* of a *Pond*; Or put it in some great hollow *Tree*; Tric also the *Sowing* of *Seeds*, in the *Bottomes* of *Cau*es; And *Pots* with *Seeds* sowne, hanged vp in *Wells*, some distance from the *Water*, and see what the *Euent* will be.

Experiments  
in Confort,  
touching the  
*Proceritie*, and  
*Lownesse*, and  
*Artificiall* *dwar-*  
*ving* of *Trees*.

532

IT is certaine, that *Timber-Trees* in *Coppice-Woods*, grow more vpright, and more free from *Vnder-Boughes*, than those that stand in the *Fields*: The *Cause* whereof is, for that *Plants* haue a *Naturall Motion*, to get to the *Sunne*; And besides, they are not glutted with too much *Nourishment*; For that the *Coppice* shareth with them; And *Repletion* euer hindreth *Stature*; Lastly, they are kept warme; And that euer in *Plants* helpeth *Mounting*.

533

*Trees*, that are, of themselves, full of *Heat*, (which *Heat* appeareth by their *Inflammable Gumm*es,) as *Firres*, and *Pines*, mount of themselves in *Height* without *Side-Boughes*, till they come towards the *Top*. The *Cause* is, partly *Heat*; And partly *Tenuitie* of *Iuyce*; Both which send the *Sap* vpwards. As for *Iuniper*, it is but a *Shrub*, and groweth not big enough in *Body*, to maintaine a tall *Tree*.

534

It is reported, that a Good Strong *Canuas*, spread ouer a *Tree* grafted low, soone after it putteth forth, will *dwarfe* it, and make it spread. The *Cause* is plaine; For that all *Things* that grow, will grow as they finde *Roome*.

535

*Trees* are generally set of *Roots*, or *Kernells*; But if you set them of *Slips*, (as of some *Trees* you may, by name the *Mulberry*,) some of the *Slips* will take; And those that take, (as is reported,) will be *Dwarfe-Trees*. The *Cause* is, for that a *Slip* draweth *Nourishment* more weakly, than either a *Root*, or *Kernell*.

536

All *Plants*, that put forth their *Sap* hastily, haue their *Bodies* not proportionable to their *Length*; And therefore they are *Winders*, and *Creeper*s; As *Iuy*, *Briony*, *Hops*, *Woodbine*: Whereas *Dwarfing* requireth a slow *Putting forth*, and lesse *Vigour* of *Mounting*.

Experiments  
in Confort,  
touching the

The *Scripture* saith; that *Salomon* wrote a *Naturall History*, from the *Cedar* of *Libanus*, to the *Mosse* growing vpon the *Wall*:

For



For so the best *Translations* haue it. And it is true that *Mosse* is but the *Rudiment* of a *Plant*; And (as it were) the *Mould* of *Earth*, of *Barke*.

Rudiments of  
Plants, and of  
the Excrescen-  
ces of Plants, or  
Super-Plants.

*Mosse* groweth chiefly vpon *Ridges* of *Houses*, tiled or thatched; And vpon the *Crests* of *Walls*. And that *Mosse* is of a lightsome, and pleasant *Greene*. The Growing vpon *Slopes* is caused, for that *Mosse*, as on the one side it commeth of *Moisture* and *Water*, so on the other side the *Water* must but *Slide*, and not *Stand* or *Poole*. And the Growing vpon *Tiles*, or *Walls*, &c. is caused, for that those dried *Earths*, hauing not *Moisture* sufficient to put forth a *Plant*, doe praetise *Germination* by Putting forth *Mosse*; Though when by *Age*, or otherwise, they grow to relent and resolute, they sometimes put forth *Plants*; As *Wall-Flowers*. And almost all *Mosse* hath here and there little *Stalkes*, besides the low *Thrumme*.

537

*Mosse* groweth vpon *Alleyes*, especially such as lye *Cold*, and vpon the *North*; As in diuers *Tarrasses*: And againe, if they be much trodden; Or if they were, at the first, grauelled; For wherefoeuer *Plants* are kept downe, the *Earth* putteth forth *Mosse*.

538

*Old Ground*, that hath beene long vnbroken vp, gathereth *Mosse*: And therefore Husbandmen vse to cure their *Pasture Grounds*, when they grow to *Mosse*, by Tilling them for a yeare, or two: Which also dependeth vpon the same *Cause*; For that, the more *Sparing* and *Staruing* luyce of the *Earth*, insufficient for *Plants*, doth breed *Mosse*.

539

*Old Trees* are more *Mossie*, (farre) than *Young*; For that the *Sap* is not so francke as to rise all to the *Boughes*, but tireth by the way, and putteth out *Mosse*.

540

*Fountaines* haue *Mosse* growing vpon the *Ground* about them;

541

*Muscoli Fontes*; —————

The *Cause* is, for that the *Fountaines* draine the *Water* from the *Ground* *Adiacent*, and leaue but sufficient *Moisture* to breed *Mosse*: And besides, the *Coldnesse* of the *Water* conduceth to the same.

The *Mosse* of *Trees*, is a kinde of *Haire*; For it is the luyce of the *Tree*, that is *Excerned*, and doth not *Assimilate*. And vpon great *Trees* the *Mosse* gathereth a *Figure*, like a *Leafe*.

542

The *moister Sort* of *Trees* yeeld little *Mosse*; As wee see in *Aspes*, *Poplars*, *Willowes*, *Beeches*, &c. Which is partly caused, for the Reason that hath beene giuen, of the francke Putting vp of the *Sap* into the *Boughes*; And partly, for that the *Barkes* of those *Trees*, are more *Close* and *Snooth*, than those of *Oakes*, and *Albes*; Whereby the *Mosse* can the hardlier issue out.

543

In *Clay-Grounds*, all *Fruit-Trees* grow full of *Mosse*, both vpon *Body* and *Boughes*; Which is caused, partly by the *Coldnesse* of the *Ground*, whereby the *Plants* nourish lesse; And partly by the *Toughnesse* of the *Earth*, whereby the *Sap* is shut in, and cannot get vp, to spread so franckly, as it should doe.

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We



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We haue said heretofore, that if *Trees* be *Hide-bound*, they wax lesse Fruitfull, and gather *Mosse*: And that they are holpen by *Hacking*, &c. And therefore by the Reason of Contraries, if *Trees* be bound in with *Cords*, or some Outward *Bands*, they will put forth more *Mosse*: Which (I thinke) happeneth to *Trees* that stand Bleake, and vpon the Cold Winds. It would also be tried, whether if you couer a *Tree*, somewhat thicke vpon the top, after his Powling, it will not gather more *Mosse*. I thinke also, the *Watring* of *Trees* with Cold *Fountaine-Water*, will make them grow full of *Mosse*.

546

There is a *Mosse* the *Perfumers* haue, which commeth out of *Apple-Trees*, that hath an Excellent Senn. *Quere* particularly for the *Manner* of the *Growth*, and the *Nature* of it. And for this *Experiments* sake, being a Thing of Price, I haue set downe the last *Experiments*, how to multiply, and call on *Mosses*.

Next vnto *Mosse*, I will speake of *Mushromes*; Which are likewise an *Vnperfect Plant*. These *Mushromes* haue two strange *Properties*; The One, that they yeeld so *Delicious* a *Meat*; The other, that they come vp so *hastily*; As in a *Night*; And yet they are *Vnsowne*. And therefore, such as are *Vp-starts* in *State*, they call, in reproach, *Mushromes*. It must needs be therefore, that they bee made of much *Moisture*; And that *Moisture* Fat, *Grosse*, and yet somewhat *Contoected*. And (indeed) we finde that *Mushromes* cause the *Accident*, which we call *Incubus*, or the *Mare*, in the *Stomacke*. And therefore the *Surfet* of them may *Suffocate*, and *Empoison*. And this sheweth, that they are *Windy*; And that *Windinesse* is *Grosse*, and *Swelling*; Not *Sharpe*, or *Griping*. And vpon the same reason *Mushromes* are a *venercous Meat*.

547

It is reported, that the *Barke* of *White*, or *Red Poplar*, (which are of the *Moistest* of *Trees*.) cut small, and cast into *Furrowes* well dunged, will cause the *Ground* to put forth *Mushromes*, at all *Seasons* of the *Yeare*, fit to be eaten. Some adde to the *Mixture* *Leauen* of *Bread*, resolved in *Water*.

548

It is reported, that if a *Hilly-Field*, where the *Stubble* is standing, bee set on *Fire*, in a *Showrie Season*, it will put forth great *Store* of *Mushromes*.

549

It is reported, that *Harts-Horne*, *Shauen*, or in *Small Peeces*, mixed with *Dung*, and *watred*, putteth vp *Mushromes*. And wee know *Harts-Horne* is of a *Fat* and *Clammie Substance*; And it may be *Oxe-Horne* would doe the like.

550

It hath bene reported, though it be scarce credible, that *Iuy* hath growne out of a *Stags-Horne*; Which they suppose, did rather come from



from a *Confrication* of the *Horne* vpon the *lay*, than from the *Horne* it selfe. There is not knowne any Substance, but *Earth*, and the *Procedures* of *Earth*, (as *Tile*, *Stone*, &c.) that yeeldeth any *Mosse*, or *Herby Substance*. There may be *Triall* made of some *Seeds*, as that of *Fennell-Seed*, *Mustard-Seed*, and *Rape-Seed*, put into some little *Holes*, made in the *Hornes* of *Stags*, or *Oxen*, to see if they will grow.

There is also another *Vnperfect Plant*, that (in shew) is like a great *Mushrome*: And it is sometimes as broad as ones *Hat*; Which they call a *Toads-Stoole*: But it is not *Esculent*; And it groweth (commonly) by a dead *Stub* of a *Tree*; And likewise about the *Roots* of *Rotten Trees*: And therefore seemeth to take his *Iuyce* from *Wood Putrified*. Which sheweth, by the way, that *Wood Putrified* yeeldeth a franke *Moisture*.

There is a *Cake*, that groweth vpon the *Side* of a *Dead Tree*, that hath gotten no *Name*, but it is large, and of a *Chestnut Colour*, and hard, and pithy; Whereby it should seeme, that euen *Dead Trees* forget not their *Putting forth*; No more than the *Carcasses* of *Mens Bodies*, that put forth *Haire*, and *Nails*, for a *Time*.

There is a *Cod*, or *Bagge*, that groweth commonly in the *Fields*; That at the first is hard like a *Tennis-Ball*, and white; And after groweth of a *Mushrome Colour*, and full of light *Dust* vpon the *Breaking*: And is thought to be dangerous for the *Eyes*, if the *Powder* get into them; And to bee good for *Kibes*. Belike it hath a *Corrosive*, and *Fretting Nature*.

There is an *Herbe* called *Jewes-Eare*, that groweth vpon the *Roots*, and *Lower Parts* of the *Bodies* of *Trees*; Especially of *Elders*, and sometimes *Albes*. It hath a strange *Property*; For in *Warme-water*, it swelleth, and openeth extremely. It is not greene, but of a duskie browne *Colour*. And it is vsed for *Squinancies*, and *Inflammations* in the *Throat*; Whereby it seemeth to haue a *Mollifying*, and *Lenifying Vertue*.

There is a *Kinde* of *Spongie Excrecence*, which groweth chiefly vpon the *Roots* of the *Laser-Tree*; And sometimes vpon *Cedar*, and other *Trees*. It is very *White*, and *Light*, and *Friable*: Which we call *Agaricke*. It is famous in *Physicke* for the *Purging* of *Tough flegme*. And it is also an excellent *Opener* for the *Liner*: But *Offensive* to the *Stomacke*; And in *Taste* it is, at the first, *Sweet*, and after *Bitter*.

We finde no *Super-Plant*, that is a *Formed Plant*, but *Misseltoe*. They haue an idle *Tradition*, that there is a *Bird*, called a *Missel-bird*, that feedeth vpon a *Seed*, which many times shee cannot digest, and so expelleth it whole with her *Excrement*: which falling vpon a *Bough* of a *Tree*, that hath some *Rif*, putteth forth the *Misseltoe*. But this is a *Fable*: For it is not probable, that *Birds* should feed vpon that they cannot digest. But allow that, yet it cannot be for other *Reasons*: For *First*, it is found but vpon certaine *Trees*; And those *Trees* beare no such *Fruit*, as may allure that *Bird* to sit, and feed vpon them. It may be, that *Bird* feedeth vpon the *Misseltoe-Berries*, and so is often found there; Which may haue giuen occasion to the *Tale*. But that which maketh an *End* of the *Question*,

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tion, is, that *Misseltoc* hath beene found to put forth vnder the *Boughes*, and not (only) aboue the *Boughes*: So it cannot be any Thing that fall-  
leth vpon the *Bough*. *Misseltoc* groweth chiefly vpon *Crab-Trees*, *Apple-Trees*, sometimes vpon *Hawes*; And rarely vpon *Oakes*; The *Misseltoc* whereof is counted very *Medicinall*. It is euer greene, Winter and Summer; And beareth a *White Glistering Berry*: And it is a *Plant* vtterly differing from the *Plant*, vpon which it groweth. Two things therefore may be certainly set downe: First, that *Super-fetation* must be by *Abundance* of *Sap*, in the *Bough* that putteth it forth: Secondly, that that *Sap* must be such, as the *Tree* doth exerce, and cannot assimilate; For else it would goe into a *Bough*; And besides, it seemeth to be more Fat and Viscuous, than the Ordinary *Sap* of the *Tree*; Both by the *Berry*, which is Clammie; And by that it continueth greene, Winter and Summer, which the *Tree* doth not.

557

This *Experiment* of *Misseltoc* may giue Light to other *Practises*. Therefore *Triall* would be made, by *Ripping* of the *Bough* of a *Crab-Tree*, in the *Barke*; And *Watring* of the *Wound* euery *Day*, with *Warmed Water Dugged*, to see if it would bring forth *Misseltoc*, or any such like Thing. But it were yet more likely to trie it, with some other *Watring*, or *Anointing*, that were not so *Naturall* to the *Tree*, as *Water* is; As *Oyle*, or *Barme* of *Drinke*, &c. So they be such Things as kill not the *Bough*.

558

It were good to trie, what *Plants* would put forth, if they be forbidden to put forth their *Naturall Boughes*: Poll therefore a *Tree*, and couer it, some thicknesse, with *Clay* on the *Top*; And see what it will put forth. I suppose it will put forth *Roots*; For so will a *Cions*, being turned downe into *Clay*: Therefore, in this *Experiment* also, the *Tree* would be closed with somewhat, that is not so *Naturall* to the *Plant*, as *Clay* is. Trie it with *Leather*, or *Cloth*, or *Painting*, so it be not hurtfull to the *Tree*. And it is certaine, that a *Brake* hath beene knowne to grow out of a *Pollard*.

559

A Man may count the *Prickles* of *Trees* to be a kinde of *Excrecence*; For they will neuer be *Boughes*, nor beare *Leaves*. The *Plants* that haue *Prickles*, are *Thornes*, blacke and white; *Brier*; *Rose*; *Limon-Trees*; *Crab-Trees*; *Goose-Berry*; *Berberie*; These haue it in the *Bough*; The *Plants* that haue *Prickles* in the *Leafe*, are; *Holly*; *Iuniper*; *Whin-bush*; *Thistle*; *Nettles* also haue a small *Venemous Prickle*; So hath *Burrage*, but harmelesse. The *Cause* must be *Hasty Putting forth*; *Want* of *Moisture*; And the *Closenesse* of the *Barke*; For the *Haste* of the *Spirit* to put forth, and the *Want* of *Nourishment* to put forth a *Bough*, and the *Closenesse* of the *Barke*, cause *Prickles* in *Boughes*; And therefore they are euer like a *Pyramis*, for that the *Moisture* spendeth after a little *Putting forth*. And for *Prickles* in *Leaves*, they come also of *Putting forth more Iuyce* into the *Leafe*, than can spread in the *Leafe* smooth; And therefore the *Leaves* otherwise are *Rough*, as *Burrage* and *Nettles* are. As for the *Leaves* of *Holly*, they are *Smooth*, but neuer *Plaine*, but as it were with *Folds*, for the same *Cause*.

There



There bee also *Plants*, that though they haue no *Prickles*, yet they haue a Kinde of *Downy* or *Veluet Rine*, vpon their *Leaues*; As *Rose Cam- pion*, *Stock-Gilly-Flowers*, *Colts-Foot*; which *Downe*, or *Nap* commeth of a *Subtill Spirit*, in a *Soft* or *Fat Substance*. For it is certaine, that both *Stock-Gilly-Flowers*, and *Rose-Campions*, stamped, haue beene applyed, (with successe) to the *Wrests* of those that haue had *Tertian*, or *Quartan Agues*; And the *Vapour* of *Colts-Foot* hath a *Sanatiue* vertue, towards the *Lungs*; And the *Leafe* also is *Healing* in *Surgery*.

560

Another Kinde of *Excrecence* is an *Exudation* of *Plants*, ioyned with *Putrefaction*; As we see in *Oake-Apples*, which are found chiefly vpon the *Leaues* of *Oakes*; And the like vpon *Willowes*: And Countrey Peo- ple haue a kinde of *Prediction*, that if the *Oake-Apple*, broken, be full of *Wormes*, it is a *Signe* of a *Pestilent Yeere*; Which is a likely Thing, be- cause they grow of *Corruption*.

561

There is also vpon *Sweet*, or other *Brier*, a fine *Tuft*, or *Brush* of *Mosse*, of diuers *Colours*; Which if you cut, you shall euer finde full of little white *Wormes*.

562

IT is certaine, that *Earth*, taken out of the *Foundations* of *Vaults* and *Houses*, and *Bottomes* of *Wells*, and then put into *Pots*, will put forth *Sundry Kinds* of *Herbs*: But some *Time* is required, for the *Germination*; For if it be taken, but from a *Fathome* deepe, it will put forth the *First Yeere*; If much deeper, not till after a *Yeere*, or *Two*.

Experiments  
in Confort  
touching the  
Producing of  
Perfect Plants  
without Seed.

The *Nature* of the *Plants* growing out of *Earth* so taken vp, doth fol- low the *Nature* of the *Mould* it selfe; As if the *Mould* be *Soft*, and *Fine*, it putteth forth *Soft Herbs*; As *Grasse*, *Plantine*, and the like; If the *Earth* be *Harder* and *Courser*, it putteth forth *Herbs* more *Rough*, as *Thistles*, *Firres*, &c.

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It is *Common Experience*, that where *Alleyes* are close *Granelled*, the *Earth* putteth forth, the first yeere, *Knot-grasse*, and after *Spire-grasse*. The *Cause* is, for that the *Hard Granel*, or *Pebble* at the first *Laying*, will not suffer the *Grasse* to come forth vpright, but turneth it to finde his way where it can; But after that the *Earth* is somewhat loosened at the *Top*, the *Ordinary Grasse* commeth vp.

565

It is reported, that *Earth*, being taken out of *Shady* and *Watry Woods*, some depth, and *Potted*, will put forth *Herbs* of a *Fat* and *Iuicy Sub- stance*; As *Penny-wort*, *Purslane*, *Houfleeke*, *Penny-royall*, &c.

566

The *Water* also doth send forth *Plants*, that haue no *Roots* fixed in the *Bottom*; But they are lesse *Perfect Plants*, being almost but *Leaues*, and those *Small ones*: Such is that we call *Duck-Weed*; Which hath a *Leafe* no bigger than a *Thyme-Leafe*, but of a fresher *Greene*, and put- teth forth a little *String* into the *Water*, farre from the *Bottom*. As for the *Water-Lilly*, it hath a *Root* in the *Ground*: And so haue a *Number* of other *Herbs* that grow in *Ponds*.

567

It is reported by some of the *Ancients*, and some *Moderne Testimony* likewise, that there be some *Plants*, that grow vpon the *Top* of the *Sea*;

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Being supposed to grow of some *Concretion* of *Slime* from the *Water*, where the *Sunne* beateth hot, and where the *Sea* stirreth little. As for *Alga Marina* (*Sea-weed*,) and *Eryngium* (*Sea-Thistle*,) both haue *Roots*; but the *Sea-weed* vnder the *Water*, the *Sea-Thistle* but vpon the *Shore*.

569

The *Ancients* haue noted, that there are some *Herbs*, that grow out of *Snow*, laid vp close together, and *Putrified*; And that they are all *Bitter*; And they name one specially, *Flomus*, which we call *Moth-Mullein*. It is certaine, that *Wormes* are found in *Snow* commonly, like *Earth-Wormes*; And therefore it is not vnlike, that it may likewise put forth *Plants*.

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The *Ancients* haue affirmed, that there are some *Herbs*, that grow out of *Stone*; Which may be, for that it is certaine, that *Toads* haue bin found in the Middle of a *Free-Stone*. We see also, that *Flints*, lying about *Ground*, gather *Mosse*; And *Wall-Flowers*, and some other *Flowers*, grow vpon *Walls*; But whether vpon the *Maine Bricke*, or *Stone*, or whether out of the *Lime* or *Chimneys*, is not well obserued; For *Elders* and *Asbes* haue beene seene to grow out of *Steeple*s: But they manifestly grow out of *Clefts*; In so much as when they grow big, they wil disioyne the *Stone*. And besides it is doubtfull, whether the *Mortar* it selfe putteth it forth, or whether some *Seeds* bee not let fall by *Birds*. There be likewise *Rock-Herbs*; But I suppose those are, where there is some *Mould*, or *Earth*. It hath likewise beene found, that great *Trees* growing vpon *Quarries*, haue put downe their *Root* into the *Stone*.

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In some *Mines* in *Germany*, as is reported, there grow in the *Bottom* *Vegetables*; And the *Work-Folkes* vse to say, they haue *Magical Vertue*; And will not suffer Men to gather them.

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The *Sea-Sands* seldome beare *Plants*. Whereof the *Cause* is yeelded, by some of the *Ancients*, for that the *Sunne* exhalet the *Moisture*, before it can incorporate with the *Earth*, and yeeld a *Nourishment* for the *Plant*. And it is affirmed also, that *Sand* hath (alwaies) his *Root* in *Clay*; And that there be no *Veines* of *Sand*, any great depth within the *Earth*.

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It is certaine, that some *Plants* put forth for a time, of their owne *Store*, without any *Nourishment* from *Earth*, *Water*, *Stone*, &c. Of which *Vide* the *Experiment 29*.

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in Consort,  
touching For-  
raine Plants.

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It is reported, that *Earth*, that was brought out of the *Indies*, and other *Remote Countries*, for *Ballast* of *Ships*, cast vpon some *Grounds* in *Italy*, did put forth *Forraine Herbs*, to vs in *Europe* not knowne; And, that which is more, that of their *Roots*, *Barkes*, and *Seeds*, contused together, and mingled with other *Earth*, and well Watred with *Warme Water*, there came forth *Herbs* much like the Other.

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*Plants* brought out of *Hot Countries*, will endeour to put forth, at the same *Time*, that they vsually doe in their owne *Climate*; And therefore to prelerue them, there is no more required, than to keepe them from the *Iniury* of Putting backe by *Cold*. It is reported also, that *Graine* out

of



of the *Hotter Countries* translated into the *Colder*, will be more forward<sup>r</sup> than the Ordinary *Graine* of the *Cold Countrie*. It is likely, that this will proue better in *Graines*, than in *Trees*; For that *Graines* are but *Annual*; And so the *Vertue* of the *Seed* is not worne out; Whereas in a *Tree*, it is embased by the *Ground*, to which it is Remoued.

Many *Plants*, which grow in the *Hotter Countries*; being set in the *Colder*, will neuerthelesse, euen in those *Cold Countries*, being sowne of *Seeds* late in the *Spring*, come vp and abide most Part of the *Summer*; As we finde it in *Orenge*, and *Limon-Seeds*, &c. The *Seeds* whereof, Sowne in the End of *Aprill*, will bring forth Excellent *Sallets*, mingled with other *Herbs*. And I doubt not, but the *Seeds* of *Cloue-Trees*, and *Pepper-Seeds*, &c. if they could come hither *Greene* enough to be sowne, would doe the like.

**T** Here be some *Flowers*, *Blossomes*, *Graines*, and *Fruits*, which come more *Early*; And Others which come more *Late* in the *Yeere*. The *Flowers* that come early, with vs, are; *Prime-Roses*, *Violets*, *Anemonies*, *Water-Daffadillies*, *Crocus Vernus*, and some early *Tulippa's*. And they are all *Cold Plants*; Which therefore (as it should seeme) haue a quicker *Perception*, of the *Heat* of the *Sunne* I decreasing, than the *Hot Herbs* haue; As a *Cold Hand* will sooner finde a little *Warmth*, than a *Hot*. And those that come next after, are *Wall-Flowers*, *Cowslips*, *Hyacinths*, *Rose-mary-Flowers*, &c. And after them, *Pincks*, *Roses*, *Flowerdeluces*, &c. And the latest are *Gilly-Flowers*, *Holly-oakes*, *Larkes-Foot*, &c. The Earliest *Blossomes* are, the *Blossomes* of *Peaches*, *Almonds*, *Cornelians*, *Mezerions*, &c. And they are of such *Trees*, as haue much *Moisture*, either *Wat-trie*, or *Oylie*. And therefore *Crocus Vernus* also, being an *Herbe*, that hath an *Oily Iuyce*, putteth forth early. For those also finde the *Sunne* sooner than the *Drier Trees*. The *Graines* are, first *Rye* and *Wheat*; Then *Oats* and *Barley*; Then *Pease* and *Beanes*. For though *Greene Pease* and *Beanes* be eaten sooner, yet the *Drie Ones*, that are vsed for *Horse-meat*, are ripe last; And it seemeth that the *Fatter Graine* commeth first. The Earliest *Fruits* are, *Strawberries*, *Cherries*, *Gooseberries*, *Corrans*; And after them *Early Apples*, *Early Peares*, *Apricots*, *Rasps*; And after them *Damasins*, and most Kinde of *Plums*, *Peaches*, &c. And the latest are *Apples*, *Wardens*, *Grapes*, *Nuts*, *Quinces*, *Almonds*, *Sloes*, *Brier-Berries*, *Heps*, *Med-lars*, *Seruices*, *Cornelians*, &c.

It is to be noted, that (commonly) *Trees* that ripen latest, blossom soonest: As *Peaches*, *Cornelians*, *Sloes*, *Almonds*, &c. And it seemeth to be a *Worke* of *Prouidence*, that they blossom so soone; For otherwise, they could not haue the *Sunne* long enough to ripen.

There be *Fruits*, (but rarely,) that come twice a *Yeare*; as some *Peares*, *Strawberries*, &c. And it seemeth they are such, as abound with *Nourishment*; Whereby after one *Period*, before the *Sunne* waxeth too weake, they can endure another. The *Violet* also, amongst *Flowers*, commeth twice a *Yeare*; Especially the *Double White*; And that also

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come forth.

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is a *Plant* full of Moisture. *Roses* come twice, but it is not without *Cutting*, as hath beene formerly said.

§ 80

In *Musconia*, though the *Corne* come not vp, till late *Spring*, yet their *Haruest* is as Early as Ours. The Cause is, for that the *Strength* of the *Ground* is kept in with the *Snow*; And we see with vs, that if it bee a long *Winter*, it is commonly a more *Plentifull Yeere*: And after those kinde of *Winters* likewise, the *Flowers*, and *Corne*, which are Earlier, and Later, doe come commonly at once, and at the same time; Which troubleth the *Husbandman* many times; For you shall haue *Red Roses*, and *Damaske Roses*, come together; And likewise the *Haruest* of *Wheat* and *Barley*. But this happeneth euer, for that the Earlier staieth for the Later; And not that the Later commeth sooner.

§ 81

There be diuers *Fruit-Trees*, in the *Hot Countries*, which haue *Blossomes*, and *Young Fruit*, and *Ripe Fruit*, almost all the *Yeere*, succeeding one another. And it is said, the *Orange* hath the like with vs, for a great Part of *Summer*; And so also hath the *Figge*. And no doubt, the *Naturall Motion* of *Plants*, is to haue so; But that either they want *Iuyce* to spend; Or they meet with the *Cold* of the *Winter*: And therefore this *Circle of Ripening* cannot be, but in *Succulent Plants*, and *Hot Countries*.

§ 82

Some *Herbs* are but *Annually*, and die, *Root* and all, once a *Yeere*; As *Borage*, *Lettuce*, *Cucumbers*, *Muske-Melons*, *Basil*, *Tobacco*, *Mustard-Seed*, and all kinde of *Corne*; Some continue many *Yeeres*; As *Hyssope*, *Germander*, *Launander*, *Fennell*, &c. The Cause of the *Dying* is double; The first is the *Tendernesse* and *Weaknesse* of the *Seed*, which maketh the *Period* in a small time; As it is in *Borage*, *Lettuce*, *Cucumbers*, *Corne*, &c. And therefore none of these are *Hot*. The other Cause is, for that some *Herbs* can worse endure *Cold*; As *Basill*, *Tobacco*, *Mustard-Seed*. And these haue (all) much *Heat*.

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in Confort  
touching the  
Lasting of Herbs  
and Trees.

§ 83

THE *Lasting* of *Plants* is most in those that are *Largest* of *Body*; As *Oakes*, *Elme*, *Chest-Nut*, the *Loat-Tree*, &c. And this holdeth in *Trees*; But in *Herbs* it is often contrary; For *Borage*, *Colewort*, *Pompions*, which are *Herbs* of the *Largest Size*, are of small *Durance*; Whereas *Hyssope*, *Winter-Sauory*, *Germander*, *Thyme*, *Sage*, will last long. The Cause is, for that *Trees* last according to the *Strength*, and *Quantity* of their *Sap* and *Iuyce*; Being well munit by their *Barke* against the *Iniuries* of the *Aire*: But *Herbs* draw a *Weake Iuyce*; And haue a *Soft Stalke*; And therefore those amongst them which last longest, are *Herbs* of *Strong Smell*, and with a *Sticky Stalke*.

§ 84

*Trees* that beare *Mast*, and *Nuts*, are commonly more lasting, than those that beare *Fruits*; Especially the *Moister Fruits*: As *Oakes*, *Beeches*, *Chest-nuts*, *Wall-nuts*, *Almonds*, *Pine-Trees*, &c. last longer than *Apples*, *Pears*, *Plums*, &c. The Cause is the *Fatnesse* and *Oilinesse* of the *Sap*; Which euer wasteth lesse, than the more *Watry*.

§ 85

*Trees*, that bring forth their *Leaues* late in the *Yeere*, and cast them likewise late, are more *lasting*, than those that sprout their *Leaues* Early, or shed



shed them betimes. The Cause is, for that the late *Comming forth* sheweth a *Moisture* more fixed; And the other more loose, and more easily resolved. And the same Cause is, that *Wilde Trees* last longer than *Garden-Trees*; And in the same kinde, those whose *Fruit* is Acide, more than those whose *Fruit* is sweet.

Nothing procureth the *Lasting* of *Trees*, *Bushes*, and *Herbs*, so much, as often *Cutting*: For every *Cutting* causeth a Renouation of the *Iuyce* of the *Plant*; That it neither goeth so farre, nor riseth so faintly, as when the *Plant* is not *Cut*: Inso much as *Annual Plants*, if you cut them seasonably, and will spare the use of them, and suffer them to come vp still young, will last more *Yeeres* than one; As hath beene partly touched; Such as is *Lettuce*, *Purslane*, *Cucumber*, and the like. And for *Great Trees*, we see almost all *Over-growne Trees*, in *Church-yards*, or neere *Ancient Buildings*, and the like, are *Pollards*, or *Dottards*, and not *Trees* at their full Height.

Some *Experiment* would be made, how by *Art* to make *Plants* more *Lasting* than the ordinary Period; As to make a *Stalke* of *Wheat*, &c. last a whole yeere. You must euer presuppose, that you handle it so, as the *Winter* killeth it not; For we speake only of *Prolonging the Naturall Period*. I conceiue, that the *Rule* will hold; That whatsoeuer maketh the *Herbe* come later, than at his time, will make it last longer time: It were good to try it, in a *Stalke* of *Wheat*, &c. set in the *Shade*, and encompassed with a *Case* of *Wood*, not touching the *Straw*, to keepe out *Open Aire*.

As for the *Preseruatiō* of *Fruits*, and *Plants*, as well vpon the *Tree*, or *Stalke*, as gathered, we shall handle it vnder the Title of *Conservation of Bodies*.

THE *Particular Figures* of *Plants* we leaue to their *Descriptions*; But some few Things, in generall, we will obserue. *Trees* and *Herbs*, in the *Growing* forth of their *Boughes* and *Branches*, are not *Figured*, and keepe no Order. The Cause is, for that the *Sap*, being restrained in the *Rinde*, and *Barke*, breaketh not forth at all; (As in the *Bodies* of *Trees*, and *Stalkes* of *Herbs*,) till they begin to branch; And then, when they make an *Eruption*, they breake forth casually, where they finde best way, in the *Barke*, or *Rinde*. It is true, that some *Trees* are more scattered in their *Boughes*; As *Sallow-Trees*, *Warden-Trees*, *Quince-Trees*, *Medlar-Trees*, *Limon-Trees*, &c. Some are more in the forme of a *Pyramis*, and come almost to todd; As the *Peare-Tree*, (which the *Criticks* will haue to borrow his name of *πῆρ*, *Fire*,) *Orange-Trees*, *Fir-Trees*, *Service-Trees*, *Lime-Trees*, &c. And some are more spread and broad; As *Beeches*, *Hornbeame*, &c. The rest are more indifferent. The Cause of *Scattering* the *Boughes*, is the *Hasty* breacking forth of the *Sap*; And therefore those *Trees* rise not in a *Body* of any Height, but branch neere the *Ground*. The Cause of the *Pyramis*, is the *Keeping in* of the *Sap*, long before it branch; And the spending of it when it beginneth to branch, by equall degrees. The

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seuerall Figures  
of Plants.

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*Spreading* is caused by the *Carrying* vp of the *Sap*, plentifully, without Expende; And then putting it forth speedily, and at once.

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There bee diuers *Herbs*, but no *Trees*, that may be said to haue some kinde of Order, in the Putting forth of their *Leaves*: For they haue *Ioyns* or *Knuckles*, as it were Stops in their *Germination*; As haue *Gilly-Flowers*, *Pinkes*, *Fennell*, *Corne*, *Reeds*, and *Canes*. The Cause whereof is, for that the *Sap* ascendeth vnequally, and doth (as it were) tire and stop by the way. And it seemeth, they haue some *Clofenesse*, and *Hardnesse* in their *Stalke*, which hindreth the *Sap* from going vp, vntill it hath gathered into a Knot, and so is more vrged to put forth. And therefore, they are most of them hollow, when the *Stalke* is dry. As *Fennell-Stalke*, *Stubble*, and *Canes*.

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*Flowers* haue (all) exquisite *Figures*; And the *Flower-Numbers* are (chiefly) *Fine*, and *Foure*; As in *Prime-Roses*, *Brier-Roses*, *Single Musk-Roses*, *Single Pinkes*, and *Gilly-Flowers*, &c. which haue five *Leaves*: *Lillies*, *Flower-de-Luces*, *Borage*, *Buglosse*, &c. which haue foure *Leaves*. But some put forth *Leaves* not Numbred; But they are euer small Ones; As *Mary-Golds*, *Trifoile*, &c. Wee see also, that the *Sockets*, and *Supporters* of *Flowers*, are *Figured*; As in the *Fiue Brethren* of the *Rose*; *Sockets* of *Gilly-Flowers*, &c. *Leaves* also are all *Figured*; Some Round, Some Long; None Square; And many iagged on the Sides; Which *Leaves* of *Flowers* seldome are. For I account the *Jagging* of *Pinkes*, and *Gilly-Flowers*, to be like the Inequality of *Oake-leaves*, or *Vine-Leaves*, or the like; But they seldome or neuer haue any small *Purles*.

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in Confort  
touching some  
Principall Differences  
in Plants.

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OF *Plants*, some few put forth their *Blossomes* before their *Leaves*; As *Almonds*, *Peaches*, *Cornelians*, *Black-Thorne*, &c. But most put forth some *Leaves* before their *Blossomes*; As *Apples*, *Pears*, *Plums*, *Cherries*, *White-Thorne*, &c. The Cause is, for that those, that put forth their *Blossomes* first, haue either an *Acute* and *Sharpe Spirit*; (And therefore commonly they all put forth early in the Spring, and ripen very late; As most of the Particulars before mentioned;) Or else an *Oily Iuyce*, which is apter to put out *Flowers*, than *Leaves*.

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Of *Plants*, some are *Greene* all *Winter*; Others cast their *Leaves*. There are *Greene* all *Winter*, *Holly*, *Iuy*, *Box*, *Firre*, *Eugh*, *Cypresse*, *Iuniper*, *Bayes*, *Rose-Mary*, &c. The Cause of the Holding *Greene*, is the Close and Compact Substance of their *Leaves*, and the *Pedicles* of them. And the Cause of that againe, is either the *Tough*, and *Viscous Iuyce* of the *Plant*; Or the *Strength* and *Heat* thereof. Of the first Sort is *Holly*, Which is of so *Viscous* a *Iuyce*, as they make *Bird-lime* of the Barke of it. The *Stalke* of *Iuy* is *Tough* and not *Fragile*, as we see in other small *Twigs* dry. *Firre* yeeldeth *Pitch*. *Box* is a fast and heauy *Wood*, as we see it in *Bowles*. *Eugh* is a *Strong* and *Tough Wood*, as we see it in *Bowes*. Of the second Sort is *Iuniper*, which is a *Wood* *Odorate*, and maketh a hot *Fire*. *Bayes* is likewise a *Hot* and *Aromaticall Wood*; And so is *Rose-Mary* for a *Shrub*. As for the *Leaves*, their *Density* appeareth, in that, either they are *Smooth* and



and Shining, as in *Bayes, Holly, Ivy, Box, &c.* Or in that they are Hard and Spiry, as in the rest. And Triall would be made of *Grafting of Rose-Mary, and Bayes, and Box, vpon a Holly-Stocke*; Because they are *Plants* that come all *Winter*. It were good to trie it also with *Grafts* of other *Trees*, either *Fruit-Trees*, or *Wilde-Trees*; To see whether they will not yeeld their *Fruit*, or beare their *Leaves*, later, and longer in the *Winter*; because the *Sap* of the *Holly* putteth forth most in the *Winter*. It may be also a *Mezerion-Tree*, grafted vpon a *Holly*, will proue both an *Earlier*, and a *Greater Tree*.

There be some *Plants*, that beare no *Flower*, and yet beare *Fruit*: There be some, that beare *Flowers*, and no *Fruit*: There be some that beare neither *Flowers*, nor *Fruit*. Most of the great *Timber-Trees*, (as *Oakes, Beeches, &c.*) beare no apparent *Flowers*: Some few (likewise) of the *Fruit-Trees*; As *Mulberry, Wall-nut, &c.* And some *Shrubs*, (as *Iuniper, Holly, &c.*) beare no *Flowers*. Diuers *Herbs* also beare *Seeds*, (which is as the *Fruit*,) and yet beare no *Flowers*; As *Parslane, &c.* Those that beare *Flowers* and no *Fruit*, are few; As the *Double Cherry*, the *Sallow, &c.* But for the *Cherry*, it is doubtfull, whether it be not by *Art*, or *Culture*; For if it be by *Art*, then Triall would be made, whether *Apples*, and other *Fruits Blossomes*, may not be doubled. There are some Few, that beare neither *Fruit*, nor *Flower*; As the *Elme, the Poplars, Box, Brakes, &c.*

There bee some *Plants*, that shoot still vpwads, and can *Support* themselves; As the greatest Part of *Trees* and *Plants*: There be some Other, that *Creepe* along the *Ground*: Or *Winde* about other *Trees*, or *Props*, and cannot support themselves; As *Vines, Ivy, Briar, Briony, Wood-bines, Hops, Climatis, Camomill, &c.* The Cause is, (as hath beene partly touched,) for that all *Plants* (naturally) moue vpwads; But if the *Sap* put vp too fast, it maketh a slender *Stalke*, which will not support the weight: And therefore these latter Sort are all *Swift* and *Hasty* *Commers*.

**T**He first and most Ordinary *Helpe* is *Stercoration*. The *Sheeps-Dung* is one of the best; And next, the *Dung* of *Kine*: And thirdly, that of *Horses*: Which is held to be somewhat too hot, vnlesse it be mingled. That of *Pigeons* for a *Garden*, or a small Quantitie of *Ground*, excelleth. The *Ordering* of *Dung* is; If the *Ground* be *Arable*, to spread it immediately before the *Plowing* and *Sowing*; And so to *Plow* it in: For if you spead it long before, the *Sunne* will draw out much of the *Fatnesse* of the *Dung*: If the *Ground* be *Grazing Ground*, to spread it somewhat late, towards *Winter*; that the *Sunne* may haue the lesse Power to drie it vp. As for speciall *Composts* for *Gardens*, (as a *Hot Bed, &c.*) wee haue handled them before.

The Second Kind of *Compost*, is, the *Spreading* of diuers *Kinds* of *Earths*; As *Marle, Chalke, Sea-Sand, Earth vpon Earth, Pond-Earth*; And the *Mixtures* of them. *Marle* is thought to be the best; As hauing most *Fatnesse*; And

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ching all Man-  
ner of *Composts*,  
and *Helps* of  
*Ground*.

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And not Heating the *Ground* too much. The next is *Sea-Sand*; Which (no doubt) obtaineth a speciall Vertue, by the *Salt*: For *Salt* is the first Rudiment of life. *Chalke* over-heateth the *Ground* a little. And therefore is best vpon *Cold Clay-Grounds*, or *Moist Grounds*: But I heard a great *Husband* say, that it was a common Errour, to think that *Chalke* helpeth *Arable Grounds*, but helpeth not *Grazing Grounds*; Whereas (indeed) it helpeth *Grasse*, as well as *Corne*: But that which breedeth the Errour is, because after the *Chalking* of the *Ground*, they weare it out with many *Crops*, without Rest; And then (indeed) afterwards it will beare little *Grasse*, because the *Ground* is tired out. It were good to try the laying of *Chalke* vpon *Arable Grounds*, a little while before *Plowing*; And to *Plow* it in, as they doe the *Dung*; But then it must be Friable first, by *Raine*, or *Lying*: As for *Earth*, it *Compasseth* it Selfe; For I knew a *Great Garden*, that had a *Field* (in a manner) powred vpon it; And it did beare *Fruit* excellently the first yeare of the *Planting*: For the *Surface* of the *Earth* is euer the *Fruitfullest*. And *Earth* so prepared hath a double *Surface*. But it is true, as I conceiue, that such *Earth*, as hath *Salt-Petre* bred in it, if you can procure it without too much charge, doth excell. The way to hasten the *Breeding* of *Salt-Petre*, is to forbid the *Sunne*, and the *Growth* of *Vegetables*. And therefore, if you make a large *Houell*, thatched, ouer some *Quantity* of *Ground*; Nay if you doe but *Plancke* the *Ground* ouer, it will breed *Salt-Petre*. As for *Pond-Earth*, or *River-Earth*, it is a very good *Compost*; Especially if the *Pond* haue beene long vncleansed, and so the *Water* be not too *Hungry*: And I iudge it will be yet better, if there be some *Mixture* of *Chalke*.

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The Third *Helpe* of *Ground*, is, by some other *Substances*, that haue a Vertue to make *Ground* Fertile; though they be not meere *Earth*: wherein *Ashes* excell; In so much as the *Countries* about *Aetna*, and *Vesunius*, haue a kinde of *Amends* made them, for the *Mischief* the *Eruptions* (many times) doe, by the exceeding *Fruitfulnessse* of the *Soyle*, caused by the *Ashes*, scattered about. *Soot* also, though thin spred, in a *Field*, or *Garden*, is tried to be a very good *Compost*. For *Salt*, it is too Costly: But it is tried, that mingled with *Seed-Corne*, and sown together, it doth good: And I am of Opinion, that *Chalke* in Powder, mingled with *Seed-Corne*, would doe good; Perhaps as much as *Chalking* the *Ground* all ouer. As for the *Steeping* of the *Seeds*, in seuerall *Mixtures* with *Water*, to giue them Vigour; Or *Watring* *Grounds* with *Compost-Water*; We haue spoken of them before.

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The Fourth *Helpe* of *Ground*, is, the *Suffering* of *Vegetables* to die into the *Ground*; And so to Fatten it, As the *Stubble* of *Corne*, Especially *Pease*. *Brakes* cast vpon the *Ground*, in the Beginning of *Winter*, will make it very *Fruitfull*. It were good (also) to try, whether *Leaues* of *Trees* swept together, with some *Chalke* and *Dung* mixed, to giue them more Heart, would not make a good *Compost*: For there is nothing lost, so much as *Leaues* of *Trees*; And as they lye scattered, and without *Mixture*, they rather make the *Ground* soure, than otherwise.

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The Fifth *Helpe* of *Ground*, is *Heat* and *Warmth*. It hath beene anciently practised to burne *Heath*, and *Ling*, and *Sedge*, with the vantage of the *Wind*, vpon the *Ground*: We see, that *Warmth* of *Walls* and *Enclosures*, mendeth *Ground*: Wee see also that *Lying open* to the *South*, mendeth *Ground*: We see againe, that the *Foldings* of *Sheepe* helpe *Ground*, as well by their *Warmth*, as by their *Compost*: And it may be doubted, whether the *Couering* of the *Ground* with *Brakes*, in the Beginning of the *Winter*, (whereof we spake in the last *Experiment*,) helpeth it not, by reason of the *Warmth*. Nay some very good *Husbands* doe suspect, that the *Gathering* vp of *Flints*, in *Flinty Ground*, and *Laying* them on *Heapes*, (which is much vsed,) is no good *Husbandry*; For that they would keepe the *Ground* warme.

The Sixth *Helpe* of *Ground* is, by *Watering*, and *Irrigation*; which is in two Manners: The one by *Letting* in, and *Shutting* out *Waters*, at seasonable Times: For *Water*, at some Seasons, and with reasonable stay, doth good; But at some other Seasons, and with too long Stay, doth hurt. And this serueth only for *Meadowes*, which are along some *River*. The other way is, to bring *Water*, from some *Hanging Grounds*, where there are *Springs*, into the *Lower Grounds*, carrying it in some long *Furrowes*; And from those *Furrowes*, drawing it traaverse to spread the *Water*. And this maketh an excellent Improuement, both for *Corne*, and *Grasse*. It is the richer, if those *Hanging Grounds* be fruitfull, because it washeth off some of the *Fatnesse* of the *Earth*: But howsoeuer it profiteth much. Generally, where there are great *Ouerflowes*, in *Fens*, or the like, the drowning of them in the *Winter*, maketh the *Summer* following more fruitfull: The *Cause* may be, for that it keepeth the *Ground* warme, and nourisheth it: But the *Fen-Men* hold, that the *Sewers* must be kept so, as the *Water* may not stay too long in the *Spring*, till the *Weeds* and *Sedge* be growne vp; For then the *Ground* will be like a *Wood*, which keepeth out the *Sunne*; And so continueth the *Wet*; Whereby it will neuer graze (to purpose) that yeare. Thus much for *Irrigation*. But for *Avoidances*, and *Draynings* of water, where there is too much, and the *Helps* of *Ground* in that kinde, we shall speake of them in another Place.



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The first kind of Ground is that which is called the  
only ground in the world, and is called the  
the first, upon the Ground: We see that the first  
man made Ground: We see that the first  
Ground: We see that the first  
by their hands, as by their compass: And it may be divided, which  
the Ground of the Ground with the first, in the beginning of the first  
(which we speak in the last Experiment) which it is not, by reason of  
the first. Nay, for every good husband doth know, that the Ground  
ring up of him, in the first Ground, and laying them on the first, (which  
is much used) is no good husband: For that they would keep the  
Ground warm.

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The second kind of Ground is that which is called  
two kinds: The one by the first, and the other by the first, as also  
noble kind: For the first, in some seasons, and with reasonable stay, both  
good: But for the other, seasons, and with too long stay, both hurt.  
And this is the first, which is along some kind. The  
other way is, to keep the first, from some kind, where there  
are some, in the first Ground, carrying it in some long kind.  
And this is the first, drawing it in to the first, and the first.  
this is the first, in the first, both for the first, and the first. It is  
the first, if the first is the first, because it is the first off  
form of the first of the first: But howsoever it is the first.  
Generally, where there are great Outhouses, in the first, or the first, the  
growing of them in the first, makes the first, following more  
fruitful: The first may be, for that it keeps the first warm, and  
nourishes it: But the first, that the first will be kept for as  
the first may not be too long in the first, till the first and the first  
grow up: For then the first will be like a Wood, which is  
the first, and the first: And the first, which is the first.  
It will not be the first (to purpose) that year. This much  
for the first. But for the first, and the first, and the first  
water, where there is too much, and the first  
of the first in the first, we shall speak  
of this in another  
Place.





# NATVRALL HISTORIE.

## VII. Century.



**D**ifference betweene *Animate* and *Inanimate Bodies*, we shall handle fully vnder the Title of *Life*, and *Living Spirits*, and *Powers*. We shall therefore make but a briefe Mention of them in this Place. The *Maine Differences* are two. All *Bodies* haue *Spirits*, and *Pneumaticall Parts* within them: But the *Maine Differences* betweene *Animate* and *Inanimate*, are two: The first is, that the *Spirits of Things Animate*, are all Continued with themselves, and are Branched in *Voines*, and secret *Canales*, as *Blond* is: And in *Living Creatures*, the *Spirits* haue not only *Branches*, but certaine *Cells* or *Seats*, where the *Principall Spirits* doe reside, and whereunto the rest doe resort: But the *Spirits* in *Things Inanimate* are shut in, and cut off by the *Tangible Parts*; And are not peruious one to another; As *Aire* is in *Snow*. The Second *Maine Difference* is, that the *Spirits of Animate Bodies*, are all in some degree, (more or lesse,) kindled and inflamed; And haue a fine *Commixture* of *Flame*, and an *Aëriall Substance*: But *Inanimate Bodies* haue their *Spirits* no whit *Inflamed*, or *Kindled*. And this *Difference* consisteth not in the *Heat* or *Coolenesse* of *Spirits*; For *Cloues* and other *Spices*, *Naphtha* and *Petroleum*, haue exceeding *Hot Spirits*, (hotter a great deale than *Oyle*, *Wax*, or *Tallow*, &c.) but not *Inflamed*. And when any of those *Weake* and *Temperate Bodies* come

to

Experiments  
in Consort tou-  
ching the *Affi-  
nities*, and *Dis-  
ferences*, be-  
tweene *Plants*  
and *Inanimate*  
*Bodies*.

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to be Inflamed, then they gather a much greater *Heat*, than others haue *Vn-inflamed*; besides their *Light*, and *Motion*, &c.

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The *Differences*, which are *Secondary*, and proceed from these two *Radicall Differences*, are; First, *Plants* are all *Figurate* and *Determinate*, which *Inanimate Bodies* are not; For looke how farre the *Spirit* is able to Spread and Continue it selfe; So farre goeth the *Shape*, or *Figure*; And then is *determined*. Secondly, *Plants* doe nourish; *Inanimate Bodies* doe not: They haue an *Accretion*, but no *Alimentation*. Thirdly, *Plants* haue a *Period of Life*; which *Inanimate Bodies* haue nor. Fourthly, they haue a *Succeſſion*, and *Propagation* of their *Kinde*; which is not in *Bodies Inanimate*.

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The *Differences* betweene *Plants*, and *Metalls* or *Fossiles*, besides those foure before mentioned, (For *Metals* I hold *Inanimate*), are these: First, *Metalls* are more *Durable* than *Plants*: Secondly, they are more *Solid* and *Hard*: Thirdly, they are wholly *Subterrany*; Whereas *Plants* are part about *Earth*, and part vnder *Earth*.

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There be very few *Creatures*, that participate of the *Nature* of *Plants*, and *Metalls* both; *Corall* is one of the Nearest of both *Kindes*: Another is *Vitrioll*, for that is aptest to sprout with *Moisture*.

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Another speciall *Affinity* is betweene *Plants* and *Mould* or *Putrefaction*: For all *Putrefaction* (if it dissolue not in *Arefaction*) will in the end issue into *Plants*, or *Living Creatures* bred of *Putrefaction*. I account *Mosse*, and *Musbromes*, and *Agaricke*, and other of those kinds, to be but *Moulds* of the *Ground*, *Walls*, and *Trees*, and the like. As for *Flesh*, and *Fish*, and *Plants* themselves, and a Number of other things, after a *Mouldinesse*, or *Rottenesse*, or *Corrupting*, they will fall to breed *Wormes*. These *Putrefactions*, which haue *Affinity* with *Plants*, haue this *Difference* from them; That they haue no *Succeſſion* or *Propagation*, though they *Nourish*, and haue a *Period of Life*, and haue likewise some *Figure*.

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I left once, by chance, a *Citron* cut, in a close Roome, for three Summer-Moneths, that I was absent; And at my Returne, there were grown forth, out of the Pith cut, *Tufts of Haires*, an Inch long, with little blacke Heads, as if they would haue beene some *Herbe*.

Experiments  
in Consort,  
touching the  
*Affinities*, and  
*Differences*, of  
*Plants*, and *Li-  
ving Creatures*.  
And the Confi-  
ners and Parti-  
ciples of them.

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The *Affinities* and *Differences* betweene *Plants* and *Living Creatures*, are these that follow. They haue both of them *Spirits Continued*, and *Branched*, and also *Inflamed*: But first in *Living Creatures*, the *Spirits* haue a *Cell* or *Seat*, which *Plants* haue not; As was also formerly said: And secondly, the *Spirits* of *Living Creatures* hold more of *Flame*, than the *Spirits* of *Plants* doe. And these two are the *Radicall Differences*. For the *Secondary Differences*, they are as follow. First, *Plants* are all *Fixed* to the *Earth*; Whereas all *Living Creatures* are leuered, and of themselves. Secondly, *Living Creatures* haue *Locall Motion*; *Plants* haue not. Thirdly, *Living Creatures* nourish from their *Vpper Parts*, by the *Mouth* chiefly; *Plants* nourish from below, namely from the *Roots*. Fourthly, *Plants* haue their *Seed* and *Seminall Parts* vppermost; *Living Creatures* haue



haue them lower-most: And therefore it was said, not elegantly alone, but Philosophically; *Homo est Planta inuersa*; *Man is like a Plant turned upwards*: For the *Root* in *Plants*, is as the *Head* in *Living Creatures*. Fifthly, *Living Creatures* haue a more exact *Figure* than *Plants*. Sixthly, *Living Creatures* haue more *Diuersity* of *Organs* within their *Bodies*, and (as it were) *Inward Figures*, than *Plants* haue. Seuenthly, *Living Creatures* haue *Sense*, which *Plants* haue not. Eighthly, *Living Creatures* haue *Voluntary Motion*, which *Plants* haue not.

For the *Difference* of *Sexes* in *Plants*, they are oftentimes by name distinguished; As *Male-Piony*, *Female-Piony*; *Male-Rose-mary*, *Female-Rose-mary*; *Hee-Holly*, *Shee-Holly*; &c. but *Generation* by *Copulation* (certainly) extendeth not to *Plants*. The neereſt approach of it, is betweene the *Hee-Palme*, and the *Shee-Palme*; which, (as they report,) if they grow neere, incline the One to the other: In ſo much as, (that which is more ſtrange,) they doubt not to report, that to keepe the *Trees* vp-right from *Bending*, they tye *Ropes* or *Lines*, from the one to the other, that the *Contact* might be enioyed by the *Contact* of a *Middle Body*. But this may be Faigned, or at leaſt Amplified. Neuertheſſe, I am apt enough to thinke, that this ſame *Binarium* of a Stronger and a Weaker, like vnto *Maſculine* and *Feminine*, doth hold in all *Living Bodies*. It is confounded ſometimes; As in ſome *Creatures* of *Putrefaction*, whetein no *Markes* of *Diſtinction* appeare: And it is doubled ſometimes; As in *Hermaphrodites*: But generally there is a *Degree* of *Strength* in moſt *Species*.

The *Participles* or *Conſiners* betweene *Plants* and *Living Creatures*, are ſuch chiefly, as are *Fixed*, and haue no *Locall Motion* of *Remoue*, though they haue a *Motion* in their *Parts*; Such as are *Oiſters*, *Cockles*, and ſuch like. There is a Fabuloſus Narration, that in the *Northerne Countries*, there ſhould be an *Herbe* that groweth in the likeneſſe of a *Lambe*, and feedeth vpon the *Graffe*, in ſuch ſort, as it will bare the *Graffe* round about. But I ſuppoſe, that the *Figure* maketh the *Fable*; For ſo we ſee, there be *Bee-Flowers*, &c. And as for the *Graffe*, it ſeemeth the *Plant*, hauing a great *Stalke* and *Top*, doth prey vpon the *Graffe*, a good way about, by drawing the *Iuyce* of the *Earth* from it.

**T**He *Indian Fig* boweth his *Roots* downe ſo low, in one yeere, as of it ſelfe it taketh *Root* againe: And ſo multiplieth from *Root* to *Root*; Making of one *Tree* a kinde of *Wood*. The *Cauſe* is the *Plenty* of the *Sap*, and the *Softneſſe* of the *Stalke*, which maketh the *Bough*, being ouerloaden, and not ſtiffely vpheld, weigh downe. It hath *Leaues*, as broad as a little *Target*, but the *Fruit* no bigger than *Beanes*. The *Cauſe* is, for that the *Continuall Shade* increaſeth the *Leaues*, and abateth the *Fruit*; which neuertheſſe is of a pleaſant Taſte. And that (no doubt) is cauſed, by the *Suppleneſſe* and *Gentleneſſe* of the *Iuyce* of that *Plant*, being that which maketh the *Boughes* alſo ſo Flexible.

It is reported by one of the *Ancients*, that there is a certaine *Indian Tree*,

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Promiſcuons  
touching  
Plants.

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*Tree*, hauing few, but very great, *Leaues*, three Cubits long, and two broad; And that the *Fruit*, being of good Taste, groweth out of the *Barke*. It may be, there be *Plants*, that powre out the *Sap* so fast, as they haue no leifure, either to diuide into many *Leaues*, or to put forth *Stalks* to the *Fruit*. With vs *Trees* (generally) haue small *Leaues*, in comparison. The *Fig* hath the greatest; And next it the *Vine*, *Mulberry*, and *Sycamore*; And the Least are those of the *Willow*, *Birch*, and *Thorne*. But there be found *Herbs* with farre greater *Leaues* than any *Tree*; As the *Burre*, *Gourd*, *Cucumber*, and *Cole-wort*. The Cause is, (like to that of the *Indian Fig*,) the hasty and plentifull Putting forth of the *Sap*.

612

There be three *Things* in vse for *Sweetnesse*; *Sugar*, *Honey*, *Manna*. For *Sugar*, to the *Ancients* it was scarce knowne, and little vsed. It is found in *Canes*: *Quare*, whether to the first *Knuckle*, or further vp? And whether the very *Barke* of the *Cane* it selfe do yeeld *Sugar* or no? For *Honey*, the *Bee* maketh it, or gathereth it; But I haue heard from one, that was industrious in Husbandry, that the labour of the *Bee* is about the *Wax*; And that he hath knowne in the beginning of *May*, *Honey-Combs* empty of *Honey*; And within a fortnight, when the Sweet *Dewes* fall, filled like a *Cellar*. It is reported also by some of the *Ancients*, that there is a *Tree* called *Occhus*, in the Valleys of *Hyrkania*, that distilleth *Honey* in the *Mornings*. It is not vnlike, that the *Sap* and *Teares* of some *Trees*, may be sweet. It may be also, that some sweet Iuyces, fit for many vses, may be concocted out of *Fruits*, to the Thickness of *Honey*, or perhaps of *Sugar*; The likeliest are *Raisins* of the Sunne, *Figs*, and *Corrans*: The Meanes may be enquired.

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The *Ancients* report of a *Tree*, by the *Persian Sea*, vpon the *Shore-Sands*, which is nourished with the *Salt-Water*; And when the *Tide* ebbeth, you shall see the *Roots*, as it were, bare without *Barke*, (being as it seemeth corroded by the *Salt*,) and grasping the *Sands* like a *Crab*; Which neuerthelesse beareth a *Fruit*. It were good to try some *Hard Trees*, as a *Seruire-Tree*, or *Fir-Tree*, by setting them within the *Sands*.

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There be of *Plants*, which they vse for *Garments*, these that follow. *Hempe*; *Flax*; *Cotton*; *Nettles*, (whereof they make *Nettle-Cloth*;) *Sericum*, which is a *Growing Silke*; They make also *Cables* of the *Barke* of *Lime-Trees*. It is the *Stalke* that maketh the *Filaceous* Matter commonly; And sometimes the *Downe* that groweth about.

615

They haue, in some *Countries*, a *Plant* of a *Rosy Colour*, which shutteth in the *Night*, Openeth in the *Morning*, and Openeth wide at *Noone*; which the *Inhabitants* of those *Countries* say is a *Plant* that *Sleepeth*. There be *Sleepers* enow then; For almost all *Flowers* doe the like.

616

Some *Plants* there are, but rare, that haue a *Mossy* or *Downy Root*; And likewise that haue a Number of *Threds*, like *Beards*; As *Mandrakes*; whereof *Witches* and *Imposstours* make an vgly *Image*, giuing it the Forme of a *Face* at the *Top* of the *Root*, and leaue those *Strings* to make a broad *Beard* downe to the *Foot*. Also there is a Kinde of *Nard*, in *Creet*, (being a Kinde of *Phu*) that hath a *Root* hairy, like a *Rough-Footed-Dones* foot.



foot. So as you may see, there are of *Roots*, *Bulbous Roots*, *Fibrous Roots*, and *Hirsute Roots*. And, I take it, in the *Bulbous*, the Sap hasteneth most to the Aire, and Sunne: In the *Fibrous*, the Sap delighteth more in the Earth, and therefore putteth downward: And the *Hirsute* is a Middle betweene both; That besides the Putting forth vpwards, and downwards, putteth forth in Round.

There are some *Teares of Trees*, which are kembed from the *Beards of Goats*: For when the *Goats* bite and crop them, especially in the Mornings, the Dew being on, the *Teare* commeth forth, and hangeth vpon their *Beards*: Of this Sort is some kinde of *Ladanum*.

The *Irrigation* of the *Plaine-Tree* by *Wine*, is reported by the *Ancients*, to make it Fruitfull. It would be tried likewise with *Roots*; For vpon *Seeds* it worketh no great Effects.

The way to carry *Forraine Roots*, a long Way, is to vessell them close in *Earthen Vessels*. But if the *Vessels* be not very Great, you must make some Holes in the Bottome, to giue some Refreshment to the *Roots*; Which otherwise (as it seemeth) will decay, and suffocate.

The ancient *Cinnamon*, was, of all other *Plants*, while it grew, the Dryest; And those Things, which are knowne to comfort other *Plants*, did make that more Sterill; For in *Showers* it prospered worst: It grew also amongst *Busbes* of other kindes, where commonly *Plants* doe not thriue: Neither did it loue the Sunne: There might be one Cause of all those Effects; Namely, the sparing Nourishment, which that *Plant* required. *Quere* how farre *Cassia*, which is now the Substitute of *Cinnamon*, doth participate of these Things.

It is reported by one of the *Ancients*, that *Cassia*, when it is gathered, is put into the *Skins* of *Beasts*, newly fleyed; And that the *Skins* Corrupting, and Breeding *Wormes*, the *Wormes* doe deuoure the *Pith* and *Marrow* of it, and so make it Hollow; But meddle not with the *Barke*, because to them it is bitter.

There were, in Ancient Time, *Vines*, of farre greater *Bodies*, than we know any; For there haue beene *Cups* made of them, and an *Image* of *Iupiter*. But it is like they were *Wilde Vines*; For the *Vines*, that they vse for *Wine*, are so often Cut, and so much Digged and Dressed, that their Sap spendeth into the *Grapes*, and so the *Stalke* cannot increase much in *Bulke*. The *Wood* of *Vines* is very durable, without *Rotting*. And that which is strange, though no *Tree* hath the *Twigs*, while they are Greene, so brittle, yet the *Wood* dried is extreme Tough; And was vsed by the *Captaines of Armies*, amongst the *Romans*, for their *Cudgels*.

It is reported, that in some Places, *Vines* are suffered to grow like *Herbs*, spreading vpon the *Ground*; And that the *Grapes* of those *Vines* are very great. It were good to make triall, whether *Plants* that vse to be borne vp by Props, will not put forth greater *Leaves*, and greater *Fruits*, if they be laid along the *Ground*; As *Hops*, *luy*, *Wood-bine*, &c.

*Quinces*, or *Apples*, &c. if you will keepe them long, drowne them in *Honey*; But because *Honey* (perhaps) will giue them a Taste Quer-

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luscious, it were good to make Triall in Powder of Sugar; Or in Syrrup of Wine onely Boyled to Height. Both these would likewise be tried in Oranges, Limons, and Pomgranats; For the Powder of Sugar, and Syrrup of Wine, will serve for more times than once.

625

The Conservation of Fruit would be also tried in Vessels, filled with fine Sand, or with Powder of Chalke; Or in Meale and Flower; Or in Dust of Oake-wood; Or in Mill.

626

Such Fruits, as you appoint for Long Keeping, you must gather before they be full Ripe; And in a Faire and Dry Day, towards Noone; And when the Wind bloweth not South; And when the Moone is vnder the Earth; And in Decrease.

627

Take Grapes, and hang them in an Empty Vessell, well Stopped; And set the Vessell, not in a Cellar, but in some dry Place; And it is said, they will last long. But it is reported by some, they will keepe better, in a Vessell halfe full of Wine, so that the Grapes touch not the Wine.

628

It is reported, that the Preserving of the Stalke, helpeeth to preserve the Grapes; Especially if the Stalke be put into the Pith of Elder, the Elder not touching the Fruit.

629

It is reported by some of the Ancients, that Fruit put in Bottles, and the Bottles let downe into Wells vnder Water, will keepe long.

630

Of Herbs and Plants, some are good to eat Raw; As Lettuce, Endive, Purslane, Tarragon, Cresses, Cucumbers, Muske-Melons, Radish, &c. Others onely after they are Boyled, or haue Passed the Fire; As Parsley, Clary, Sage, Parsnips, Turnips, Asparagus, Artichokes, (though they also being young are eaten Raw:) But a Number of Herbs, are not Esculent at all; As Worme-wood, Grasse, Greene-Corne, Centory, Hyssope, Lavender, Balme, &c. The Causes are, for that the Herbs, that are not Esculent, do want the two Tastes, in which Nourishment resteth; Which are, Fat, and Sweet; And haue (contrariwise) Bitter and Over-strong Tastes, or a Ioyce so Crude, as cannot be ripened to the degree of Nourishment. Herbs and Plants, that are Esculent Raw, haue Fatnesse, or Sweetnesse, (as all Esculent Fruits;) Such are Onions, Lettuce, &c. But then it must bee such a Fatnesse, (for as for Sweet Things, they are in effect alwaies Esculent) as is not Over-grosse, and Loading of the Stomach; For Parsnips and Leeks haue Fatnesse; But it is too Grosse and Heauy without Boyling. It must be also in a Substance somewhat Tender; For we see Wheat, Barley, Artichokes, are no good Nourishment, till they haue Passed the Fire; But the Fire doth ripen, and maketh them soft and tender, and so they become Esculent. As for Radish and Tarragon, and the like, they are for Condiments, and not for Nourishment. And euen some of those Herbes, which are not Esculent, are notwithstanding Poculent; As Hop's, Broome, &c. Quere what Herbs are good for Drinke, besides the two aforenamed; For that it may (perhaps) ease the Charge of Brewing, if they make Beere to require lesse Malt, or make it last longer.

631

Parts fit for the Nourishment of Man, in Plants, are Seeds, Roots, and Fruits; But chiefly Seeds, and Roots. For Leaves, they giue no Nourishment,



ment, at all, or very little: No more doe *Flowers*, or *Blossomes*, or *Stalkes*. The Reason is, for that *Roots*, and *Seeds*, and *Fruits*, (in as much as all *Plants* consist of an *Oily* and *Watry Substance* commixed,) haue more of the *Oily Substance*; And *Leaues*, *Flowers*, &c. of the *Watry*. And secondly, they are more *Concocted*; For the *Root*, which continueth euer in the *Earth*, is still *Concocted* by the *Earth*; And *Fruits*, and *Graines*, (we see) are halfe a yeere, or more, in *Concocting*; Whereas *Leaues* are out, and Perfect in a Moneth.

*Plants* (for the most part) are more strong, both in *Taste*, and *Smell*, in the *Seed*, than in the *Leafe*, and *Root*. The Cause is, for that in *Plants*, that are not of a Fierce and Eager Spirit, the Vertue is increased by *Concoction*, and *Maturation*, which is euer most in the *Seed*; But in *Plants*, that are of a Fierce and Eager Spirit, they are stronger whilst the Spirit is enclosed in the *Root*; And the Spirits doe but weaken and dissipate, when they come to the *Aire*, and *Sunne*; As we see it in *Onions*, *Garlicke*, *Dragon*, &c. Nay there be *Plants*, that haue their *Roots* very Hot, and *Aromaticall*; And their *Seeds* rather *Insipide*; As *Ginger*. The Cause is (as was touched before,) for that the Heat of those *Plants* is very Dissipable; which vnder the *Earth* is contained and held in; But when it commeth to the *Aire*, it exhaleth.

The *Iuyces* of *Fruits* are either *Watry*, or *Oily*. I reckon amongst the *Watry*, all the *Fruits* out of which *Drinke* is expressed; As the *Grape*, the *Apple*, the *Peare*, the *Cherry*, the *Pomgranate*, &c. And there are some others, which, though they be not in vse for *Drinke*, yet they appeare to be of the same Nature; as *Plummes*, *Seruices*, *Mulberries*, *Rasps*, *Orenges*, *Lemons*, &c. And for those *Iuyces*, that are so fleshy, as they cannot make *Drinke* by Expression, yet (perhaps) they may make *Drinke* by Mixture of *Water*;

*Poculaq; admistis imitantur vitea Sorbis.*  
And it may bee *Heps* and *Brier-Berries* would doe the like. Those that haue *Oily Iuyce*, are; *Oliues*, *Almonds*, *Nuts* of all sorts, *Pine-Apples*, &c. And their *Iuyces* are all *Inflammable*. And you must obserue also, that some of the *Watry Iuyces*, after they haue gathered Spirit, will Burne and Enflame; As *Wine*. There is a Third Kinde of *Fruit*, that is sweet, without either *Sharpnesse* or *Oylineesse*: Such as is the *Fig*, and the *Date*.

It hath beene noted, that most *Trees*, and specially those that beare *Mast*, are fruitfull but once in two yeeres. The Cause (no doubt) is, the Expence of *Sap*; For many *Orchard-Trees*, well Cultured, will beare diuers yeeres together.

There is no *Tree*, which besides the *Naturall Fruit*, doth beare so many *Bastard-Fruits*, as the *Oake* doth: For besides the *Acorne*, it beareth *Galls*, *Oake-Apples*, and certaine *Oake-Nuts*, which are *Inflammable*; And certaine *Oake-Berries*, sticking close to the *Body* of the *Tree*, without *Stalke*. It beareth also *Misseltoe*, though rarely. The Cause of all these may be, the *Closenesse* and *Solidenesse* of the *Wood*, and *Pith* of the *Oake*; Which maketh seuerall *Iuyces* finde seuerall *Eruptions*. And therefore,

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if you will deuise to make any *Super-Plants*, you must euer giue the *Sap* Plentifull Rising, and Hard Issue.

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There are two *Excrescences* which grow vpon *Trees*; Both of them in the Nature of *Mushromes*: The one the *Romans* called *Boletus*; Which groweth vpon the *Roots* of *Oakes*; and was one of the *Dainties* of their *Table*; The other is *Medicinall*, that is called *Agaricke*, (whereof we haue spoken before) which groweth vpon the *Tops* of *Oakes*; Though it be affirmed by some, that it groweth also at the *Roots*. I doe conceiue, that many *Excrescences* of *Trees* grow chiefly, where the *Tree* is dead, or faded; For that the *Naturall Sap* of the *Tree*, corrupteth into some *Preternaturall Substance*.

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The greater Part of *Trees* beare *Most*, and *Best*, on the *Lower Boughs*; As *Oakes*, *Figs*, *Wall-Nuts*, *Peares*, &c. But some beare *Best* on the *Top-Boughes*; As *Crabs*, &c. Those that beare best below, are such, as *Shade* doth more good to, than *Hurt*. For generally all *Fruits* beare best lowest; Because the *Sap* tireth not, hauing but a short Way: And therefore in *Fruits* spred vpon *Walls*, the Lowest are the Greatest, as was formerly said; So it is the *Shade* that hindereth the *Lower Boughes*; Except it be in such *Trees*, as delight in *Shade*; Or at least beare it well. And therefore, they are either Strong *Trees*, as the *Oake*; Or else they haue large *Leaves*, as the *Walnut* and *Fig*; Or else they grow in *Pyramis*, as the *Pear*. But if they require very much *Sunne*, they beare best on the *Top*; As it is in *Crabs*, *Apples*, *Plums*, &c.

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There be *Trees* that beare best when they begin to be *Old*; As *Almonds*, *Peares*, *Vines*, and all *Trees* that giue *Mast*. The Cause is, for that all *Trees* that beare *Mast* haue an *Oily Fruit*; And *Young Trees* haue a more *Watry Iuyce*, and lesse *Concocted*; And of the same kinde also is the *Almond*. The *Pear* likewise, though it be not *Oily*, yet it requireth much *Sap*, and well *Concocted*; For we see it is a *Heavy Fruit*, and *Solid*; Much more than *Apples*, *Plummes*, &c. As for the *Vine*, it is noted, that it beareth more *Grapes* when it is *Young*; But *Grapes* that make better *Wine*, when it is *Old*; For that the *Iuyce* is better *Concocted*: And wee see that *Wine* is *Inflammable*; So as it hath a kinde of *Oylineffe*. But the most Part of *Trees*, amongst which are *Apples*, *Plummes*, &c. beare best when they are *Young*.

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There be *Plants*, that haue a *Milke* in them, when they are Cut; As *Figs*, *Old Lettuce*, *Sow-Thistles*, *Spurge*, &c. The Cause may be an *Inception* of *Putrefaction*; For those *Milkes* haue all an *Acrimony*; though one would thinke they should be *Lemitive*. For if you write vpon *Paper*, with the *Milke* of the *Fig*, the *Letters* will not be scene, vntill you hold the *Paper* before the *Fire*, and then they wax *Browne*; Which sheweth that it is a *Sharpe* or *Fretting Iuyce*: *Lettuce* is thought *Poysonous*, when it is so *Old*, as to haue *Milke*; *Spurge* is a kinde of *Poyson* in it Selse; And as for *Sow-Thistles*, though *Coneyes* eat them, yet *Sheepe* and *Cattell* will not touch them; And besides the *Milke* of them, rubbed vpon *Warts*, in short time, weareth them away: Which sheweth the *Milke*

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of them to be *Corrosive*. We see also, that *Wheat*, and other *Cornes* sown, if you take them forth of the *Ground*, before they sprout, are full of *Milke*; And the Beginning of *Germination* is euer a Kinde of *Putrefaction* of the *Seed*. *Euphorbium* also hath a *Milke*, though not very white, which is of a great *Acrimony*. And *Saladine* hath a yellow *Milke*, which hath likewise much *Acrimony*; For it cleanseth the *Eyes*. It is good also for *Cataracts*.

*Mushromes* are reported to grow, as well vpon the *Bodies* of *Trees*, as vpon their *Roots*, or vpon the *Earth*: And especially vpon the *Oake*. The Cause is, for that Strong *Trees*, are towards such *Excrecences*, in the Nature of *Earth*; And therefore Put forth *Mosse*, *Mushromes*, and the like.

There is hardly found a *Plant*, that yeeldeth a *Red Iuyce*, in the *Blade*, or *Eare*; Except it be the *Tree* that beareth *Sanguis Draconis*: Which groweth (chiefly) in the *Island Soquotra*: The *Herbe Amaranthus* (indeed,) is *Red* all ouer; And *Brasill* is *Red* in the *Wood*: And so is *Red Sanders*. That *Tree* of the *Sanguis Draconis*, groweth in the forme of a *Sugar-loafe*. It is like, that the *Sap* of that *Plant*, concocteth in the *Body* of the *Tree*. For we see that *Grapes*, and *Pomegranats*, are *Red* in the *Iuyce*, but are *Greene* in the *Teare*: And this maketh the *Tree* of *Sanguis Draconis*, lesser towards the *Top*; Because the *Iuyce* hasteneth not vp; And besides it is very *Astringent*; And therefore of *Slow Motion*.

It is reported, that *Sweet Mosse*, besides that vpon the *Apple-Trees*, groweth likewise (sometimes) vpon *Poplars*; And yet (generally) the *Poplar* is a *Smooth Tree* of *Barke*, and hath little *Mosse*. The *Mosse* of the *Larix Tree* burneth also *Sweet*, and sparkleth in the *Burning*. *Quare* of the *Mosses* of *Odorate Trees*; As *Cedar*, *Cypres*, *Lignum Aloës*, &c.

The *Death* that is most without *Paine*, hath beene noted to be, vpon the *Taking* of the *Potion* of *Hemlocke*; which in *Humanity* was the *Forme* of *Execution* of *Capitall Offenders* in *Athens*. The *Poyson* of the *Aspe*, that *Cleopatra* vsed, hath some affinity with it. The Cause is, for that the *Torments* of *Death* are chiefly raised by the *Strife* of the *Spirits*; And these *Vapours* quench the *Spirits* by *Degrees*; Like to the *Death* of an extreme *Old Man*. I conceiue it is lesse *Painfull* than *Opium*, because *Opium* hath *Parts* of *Heat* mixed.

There be *Fruits*, that are *Sweet* before they be *Ripe*; As *Mirabolanes*; So *Fennell-Seeds* are *Sweet* before they ripen, and after grow *Spicie*. And some neuer *Ripen* to be *Sweet*; As *Tamarinds*, *Berberries*, *Crabs*, *Sloes*, &c. The Cause is, for that the former Kinde haue much and subtil *Heat*, which causeth *Earely Sweetnesse*; The latter haue a *Cold* and *Acide Iuyce*, which no *Heat* of the *Sunne* can sweeten. But as for the *Mirabolane*, it hath *Parts* of *Contrary Natures*; For it is *Sweet*, and yet *Astringent*.

There be few *Herbes* that haue a *Salt Taste*; And contrariwise all *Blond* of *Liuing Creatures* hath a *Saltnesse*: The Cause may be, for that *Salt*, though it be the *Rudiment* of *Life*, yet in *Plants* the *Originall Taste* remaineth

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remaineth not; For you shall haue them *Bitter, Sowre, Sweet, Biting*, but seldome *Salt*: But in *Living Creatures*, all those High *Tastes* may happen to be (sometimes) in the *Humours*, but are seldome in the *Flesh*, or *Substance*; Because it is of a more *Oily Nature*; which is not very Susceptible of those *Tastes*; And the *Saltnesse* it selfe of *Bloud*, is but a light, and secret *Saltnesse*. And euen among *Plants*, some doe participate of *Saltnesse*, as *Alga Marina, Sampire, Scoury-Grasse, &c.* And they report, there is, in some of the *Indian-Seas*, a *Swimming Plant*, which they call *Salgazzus*, spreading ouer the *Sea*, in such sort, as one would thinke it were a *Meadow*. It is certaine, that out of the *Asbes* of all *Plants*, they extract a *Salt*, which they vse in *Medicines*.

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It is reported by one of the *Ancients*, that there is an *Herb* growing in the *Water*, called *Lincoſtis*, which is full of *Prickles*: This *Herbe* putteth forth another small *Herbe* out of the *Leafe*; which is imputed to some *Moisture*, that is gathered betweene the *Prickles*, which Putrified by the *Sunne*, Germinateth. But I remember also I haue seene, for a great *Rarity*, one *Rose* grow out of another, like *Honey-Suckles*, that they call *Top* and *Top-gallants*.

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*Barley*, (as appeareth in the *Malting*,) being steeped in *Water* three dayes, and afterwards the *Water* drained from it, and the *Barley* turned vpon a drie floare, will sprout, halfe an Inch long at least: And if it be let alone, and not turned, much more; vntill the Heart be out. *Wheat* will doe the same. Try it also, with *Pease*, and *Beanes*. This *Experiment* is not like that of the *Orpin*, and *Semper-Vine*; For there it is of the old *Store*, for no *Water* is added; But here it is nourished from the *Water*. The *Experiment* would be further driuen: For it appeareth alreadie, by that which hath beene said, that *Earth* is not necessary to the first Sprouting of *Plants*; And we see that *Rose-Buds* set in *Water*, will Blow: Therefore try whether the *Sprouts* of such *Graines* may not be raised to a further Degree; As to an *Herbe*, or *Flower*, with *Water* only; Or some small Commixture, of *Earth*: For if they will, it should seeme by the *Experiments* before, both of the *Malt*, and of the *Roses*, that they will come far faster on in *Water*, than in *Earth*: For the *Nourishment* is easilier drawne out of *Water*, than out of *Earth*. It may giue some light also, that *Drinke* infused with *Flesh*, as that with the *Capon, &c.* will nourish faster and easilier, than *Meat* and *Drinke* together. Try the same *Experiment* with *Roots*, as well as with *Graines*: as for Example, take a *Turnip*, and steepe it a while, and then dry it, and see whether it will sprout.

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*Malt* in the *Drenching* will swell; And that in such a manner, as after the Putting forth in *Sprouts*, and the drying vpon the *Keele*, there will be gained at least a Bushell in eight, and yet the *Sprouts* are rubbed off; And there will be a Bushell of *Dust* besides the *Malt*: Which I suppose to be, not only by the loose, and open Laying of the *Parts*, but by some Addition of *Substance*, drawne from the *Water*, in which it was steeped.

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*Malt* gathereth a *Sweetnesse* to the *Taste*, which appeareth yet more

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in the Wort. The *Dulcoration* of Things is worthy to be tried to the full; For that *Dulcoration* importeth a degree to *Nourishment*: And the Making of Things *Inalimentall*, to become *Alimentall*, may be an *Experiment* of great Profit, for Making new *Vicuals*.

Most *Seeds* in the Growing, leaue their *Huske* or *Rinde* about the *Root*; But the *Onion* will carry it vp, that it will be like a Cap vpon the Top of the *Young Onion*. The Cause may be, for that the *Skin* or *Huske* is not easie to breake; As we see by the Pilling of *Onions*, what a Holding Substance the *Skin* is.

*Plants*, that haue *Curled Leauers*, doe all abound with *Moisture*; Which commeth so fast on, as they cannot spread themselves *Plaine*, but must needs gather together. The Weakest Kinde of *Curling* is *Roughnesse*; As in *Clary*, and *Burre*. The Second is *Curling* on the Sides; As in *Lettuce*, and *Young Cabbage*: And the Third is *Folding* into an *Head*; As in *Cabbage* full growne, and *Cabbage-Lettuce*.

It is reported, that *Firre*, and *Pine*, especially if they be *Old* and *Putrified*, though they shine not, as some *Rotten Woods* doe, yet in the sudden *Breaking* they will sparkle like *Hard Sugar*.

The *Roots* of *Trees* doe (some of them,) put downwards deepe into the *Ground*; As the *Oake*, *Pine*, *Firre*, &c. Some spread more towards the *Surface* of the *Earth*; As the *Ash*, *Cypresse-Tree*, *Olive*, &c. The Cause of this latter may be, for that such *Trees* as loue the *Sunne*, doe not willingly descend farre into the *Earth*; And therefore they are (commonly) *Trees*, that shoot vp much; For in their *Body*, their desire of Approach to the *Sunne*, maketh them spread the lesse. And the same Reason, vnder *Ground*, to auoid Recess from the *Sunne*, maketh them spread the more. And we see it commeth to passe in some *Trees*, which haue beene planted too deepe in the *Ground*, that for loue of Approach to the *Sunne*, they forsake their first *Root*, and put out another more towards the Top of the *Earth*. And we see also, that the *Olive* is full of *Oily Inyce*; And *Ash* maketh the best *Fire*; And *Cypresse* is an *Hot Tree*. As for the *Oake*, which is of the former sort, it loueth the *Earth*; And therefore groweth slowly. And for the *Pine*, and *Firre* likewise, they haue so much *Heat* in themselves, as they need lesse the *Heat* of the *Sunne*. There be *Herbs* also, that haue the same difference; As the *Herbe* they call *Morsus Diaboli*; Which putteth the *Root* downe so low, as you cannot pull it vp without *Breaking*; Which gaue Occasion to the Name, and *Fable*; For that it was said, it was so wholesome a *Root*, that the *Devill*, when it was gathered, bit it for *Enuy*: And some of the *Ancients* doe report, that there was a *Goodly Firre*, (which they desired to remoue whole,) that had a *Root* vnder *Ground* eight *Cubits* deepe; And so the *Root* came vp broken.

It hath beene obserued, that a *Branch* of a *Tree*, being *Unbarked* some space at the Bottom, and so set into the *Ground*, hath growen; Euen of such *Trees*, as if the *Branch* were set with the *Bark* on, they would not grow, yet contrariwise we see, that a *Tree* Pared round in the *Body*, aboue *Ground*,

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Ground, will die. The Cause may be, for that the *Vnbarked Part* draweth the Nourishment best, but the *Barke* continueth it only.

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*Grapes* will continue *Fresh*, and *Moist*, all Winter long, if you hang them, *Cluster* by *Cluster*, in the *Roofe* of a *Warne Roome*; Especially, if when you gather the *Cluster*, you take off with the *Cluster* some of the *Stocke*.

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The *Reed* or *Cane* is a *Watry Plant*, and groweth not but in the *Water*; It hath these Properties; That it is *Hollow*; That it is *Knuckled* both *Stalke*, and *Root*; That being *Drie*, it is more *Hard* and *Fragile*, than other *Wood*; That it putteth forth no *Boughes*, though many *Stalkes* come out of one *Root*. It differeth much in *Greatnesse*; The smallest being fit for *Thatching* of *Houses*; And *Stopping* the *Chinkes* of *Ships*; Better than *Glew*, or *Pitch*. The *Second Bignesse*, is vsed for *Angle-Rods*, and *Stanes*; And in *China* for beating of *Offenders* vpon the *Thighes*. The differing *Kindes* of them are; The *Common Reed*; The *Cassia Fistula*; And the *Sugar-Reed*. Of all *Plants*, it boweth the easiest, and riseth againe. It seemeth, that amongst *Plants*, which are nourished with *Mixture* of *Earth* and *Water*, it draweth most Nourishment from *Water*; which maketh it the *Smoothest* of all others in *Barke*; And the *Hollowest* in *Bodie*.

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The *Sap* of *Trees*, when they are let *Blond*, is of differing *Natures*. Some more *Watry* and *Cleare*; As that of *Vines*; of *Beeches*; of *Peares*. Some *Thicke*; As *Apples*. Some *Gummie*; As *Cherries*. Some *Froathy*, As *Elmes*. Some *Milkie*; As *Figs*. In *Mulberries*, the *Sap* seemeth to be (almost) towards the *Barke* only; For if you cut the *Tree*, a little into the *Barke*, with a *Stone*, it will come forth; If you pierce it deeper with a *Toole*, it will be drie. The *Trees*, which haue the *Moistest Iuyces* in their *Fruit*, haue commonly the *Moistest Sap* in their *Body*; For the *Vines* and *Peares* are very *Moist*; *Apples* somewhat more *Spongie*; The *Milke* of the *Figge* hath the *Qualitie* of the *Rennes*, to gather *Cheese*; And so haue certaine *Sowre Herbes* wherewith they make *Cheese* in *Lent*.

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The *Timber* and *Wood* are, in some *Trees*, more *Cleane*, in some more *Knottie*; And it is a good *Triall*, to trie it by *Speaking* at one *End*, and *Laying* the *Eare* at the *Other*; For if it be *Knottie*, the *Voyce* will not passe well. Some haue the *Veines* more varied, and chamlotted; As *Oake*, whereof *Wainscot* is made; *Maple*, whereof *Trenchers* are made; Some more smooth, as *Firre*, and *Walnut*; Some doe more easily breed *Wormes* and *Spiders*; Some more hardly, as it is said of *Irish Trees*; Besides, there be a Number of Differences that concerne their *Vse*; As *Oake*, *Cedar*, and *Chestnut*, are the best *Builders*; Some are best for *Plough-Timber*; As *Ash*; Some for *Peeres*, that are sometimes wet, and sometimes drie; As *Elme*; Some for *Planchers*; As *Deale*; Some for *Tables*, *Cupboards*, and *Deskes*; As *Walnuts*; Some for *Ship-Timber*; As *Oakes* that grow in *Moist Grounds*; For that maketh the *Timber* *Tough*, and not apt to rift with *Ordnance*; Wherein *English* and *Irish Timber* are thought to excell; Some for *Masts* of *Ships*; As *Firre*, and *Pine*, because of their Length.



Length, Srraightnesse, and Lightnesse: Some for *Pale*; As *Oake*: Some for *Fuell*; As *Asb*: And so of the rest.

The *Comming* of *Trees* and *Plants* in certaine *Regions*, and not in others, is sometimes *Casual*: For many haue beene translated, and haue prospered well; As *Damaske-Roses*, that haue not beene knowne in *England* aboute an hundred yeares, and now are so common. But the liking of *Plants* in certaine *Soiles*, more than in others, is meerely *Naturall*; As the *Firre* and *Pine* loue the *Mountaines*; The *Poplar*, *Willow*, *Sallow*, and *Alder*, loue *Riuers*, and *Moist Places*: The *Asb* loueth *Coppices*; But is best in *Standards* alone: *Iuniper* loueth *Chalke*; And so doe most *Fruit-Trees*: *Sampire* groweth but vpon *Rockes*: *Reeds* and *Osiers* grow where they are washed with *Water*: The *Vine* loueth *Sides of Hills*, turning vpon the *South-East Sunne*, &c.

The *Putting forth* of certaine *Herbes* discovereth of what *Nature* the *Ground* where they put forth, is: As *wilde Thyme* sheweth good *Feeding Ground* for *Cattell*: *Betony* and *Strawberries* shew *Grounds* fit for *Wood*: *Camomill* sheweth *Mellow Grounds* fit for *Wheat*. *Mustard Seed*, growing after the *Plough*, sheweth a good *Strong Ground* also for *Wheat*: *Burnet* sheweth good *Meadow*: And the like.

There are found, in diuers *Countries*, some other *Plants*, that grow out of *Trees* and *Plants*, besides *Misseltoe*: As in *Syria*, there is an *Herbe* called *Cassytas*, that groweth out of tall *Trees*, and windeth it selfe about the same *Tree* where it groweth; And sometimes about *Thornes*. There is a kinde of *Polypode*, that groweth out of *Trees*, though it windeth not. So likewise an *Herbe* called *Faunos*, vpon the *Wilde Oline*. And an *Herbe* called *Hippophaston* vpon the *Fullers Thorne*; Which, they say, is good for the *Falling-Sicknesse*.

It hath beene obserued, by some of the *Ancients*, that howsoeuer *Cold* and *Easterly Winds*, are thought to be great *Enemies* to *Fruit*; yet neuerthelesse *South-Winds* are also found to doe *Hurt*; Especially in the *Blossoming* time; And the more, if *Showers* follow. It seemeth, they call forth the *Moisture* too fast. The *West-Winds* are the best. It hath beene obserued also that *Greene* and *Open Winters* doe hurt *Trees*; In so much as if two or three such *Winters* come together, *Almond-Trees*, and some other *Trees*, will dye. The *Cause* is the same with the former, because the *Lust* of the *Earth* ouerspendeth it selfe; Howsoeuer some other of the *Ancients* haue commended *Warne Winters*.

*Snowes*, lying long, cause a *Fruitfull Teare*: For first, they keepe in the *Strength* of the *Earth*; Secondly, they water the *Earth*, better than *Raine*; For in *Snow*, the *Earth* doth (as it were) sucke the *Water*, as out of the *Teate*. Thirdly, the *Moisture* of *Snow* is the finest *Moisture*; For it is the *Broth* of the *Cloudy Waters*.

*Showers*, if they come a little before the *Ripening* of *Fruits*, doe good to all *Succulent* and *Moist Fruits*; As *Vines*, *Olines*, *Pomegranates*; Yet it is rather for *Plentie*, than for *Goodnesse*; For the best *Wines* are in the *Driest Vintages*: *Small Showers* are likewise good for *Corne*, so as  
Parching

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*Parching Heats* come not vpon them. Generally, *Night Showers* are better than *Day-Showers*; For that the *Sunne* followeth not so fast vpon them: And wee see, euen in *Watring* by the *Hand*, it is best, in *Summer time*, to water in the *Euening*.

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The *Differences* of *Earths*, and the *Triall* of them, are worthy to be diligently inquired. The *Earth*, that with *Showers* doth easiliest *Soften*, is commended; And yet some *Earth* of that kinde will be very *Dry*, and *Hard* before the *Showers*. The *Earth* that casteth vp from the *Plough*, a *Great Clod*, is not so good, as that which casteth vp a *Smaller Clod*. The *Earth*, that putteth forth *Mosse* easily, and may be called *Mouldy*, is not good. The *Earth*, that smelleth well vpon the *Digging*, or *Plowing*, is commended; As containing the *Iuyce* of *Vegetables* almost already prepared. It is thought by some, that the *Ends* of low *Raine-Bowes*, fall more vpon one kinde of *Earth* than vpon another: As it may well be; For that that *Earth* is most *Roside*: And therefore it is commended for a *Signe* of good *Earth*. The *Poorenesse* of the *Herbs*, (it is plaine,) shew the *Poorenesse* of the *Earth*; And especially if they be in *Colour* more darke: But if the *Herbs* shew *Withered*, or *Blasted* at the *Top*, it sheweth the *Earth* to be very *Cold*: And so doth the *Mossinesse* of *Trees*. The *Earth*, whereof the *Grasse* is soone *Parched* with the *Sunne*, and *Toasted*, is commonly *Forced Earth*, and *Barren* in his owne *Nature*. The *Tender*, *Ches-some*, and *Mellow Earth*, is the best; Being meere *Mould*, betweene the two *Extremes* of *Clay*, and *Sand*; Especially if it be not *Loamy*, and *Binding*. The *Earth*, that after *Raine*, will scarce be *Plowed*, is commonly *Fruitfull*; For it is *Cleaning*, and full of *Iuyce*.

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It is strange, which is obserued by some of the *Ancients*, that *Dust* helpeth the *Fruitfulnesse* of *Trees*; And of *Vines*, by name; In so much as they cast *Dust* vpon them of purpose. It shoud seeme, that that *Pow-dring*, when a *Shower* commeth, maketh a kinde of *Soyling* to the *Tree*, being *Earth* and *Water*, finely laid on. And they note, that *Coun-tries*, where the *Fields* and *Wayes* are *Dusty*, beare the best *Vines*.

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It is commended by the *Ancients*, for an *Excellent Helpe* to *Trees*, to lay the *Stalkes* and *Leaues* of *Lupines* about the *Roots*; Or to *Plow* them into the *Ground*, where you will sowe *Corne*. The *Burning* also of the *Cuttings* of *Vines*, and *Casting* them vpon *land*, doth much *Good*. And it was generally receiued of old, that the *Dunging* of *Grounds*, when the *West Wind* bloweth, and in the *Decrease* of the *Moone*, doth greatly helpe; The *Earth* (as it seemeth) being then more thirstie, and open, to receiue the *Dung*.

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The *Grafting* of *Vines* vpon *Vines*, (as I take it,) is not now in vse: The *Ancients* had it, and that three wayes: The First was *Insition*, which is the Ordinary Manner of *Grafting*: The Second was *Terebration*, thorow the *Middle* of the *Stocke*, and Putting in the *Cions* there: And the Third was *Paring* of two *Vines*, that grow together, to the *Marrow*, and *Binding* them close.

669

The *Diseases* and ill *Accidents* of *Corne*, are worthy to be enquired; And



And would be more worthy to be enquired, if it were in Mens Power to helpe them; Whereas many of them are not to be remedied. The *Mildew* is one of the Greatest; which (out of question) commeth by *Cloſe- neſſe* of *Aire*; And therefore in *Hills*, or large *Champaigne Grounds*, it ſeldome commeth; Such as is with vs *York's Woald*. This cannot be remedied, otherwiſe than that in *Countries* of Small Encloſure, the *Grounds* be turned into larger *Fields*: Which I haue knowne to doe good in ſome *Farmes*. Another *Disease* is the *Putting forth of Wilde Oats*, where- into *Corne* oftentimes, (eſpecially *Barley*) doth degenerate. It happeneth chiefly from the *Weakneſſe* of the *Graine* that is ſowne; For if it be either too Old, or Mouldy, it will bring forth *Wilde Oats*. Another *Disease* is the *Society* of the *Ground*; For if you ſow one *Ground* ſtill with the ſame *Corne*, (I meane not the ſame *Corne* that grew vpon the ſame *Ground*,) but the ſame *Kinde* of *Graine*; (As *Wheat*, *Barley*, &c.) it will proſper but poorely: Therefore beſides the *Reſting* of the *Ground*, you muſt vary the *Seed*. Another ill *Accident* is, from the *Winds*, which hurt at two times; At the *Flowring*, by *Shaking* off the *Flowers*; And at the full *Ripening*, by *Shaking* out the *Corne*. Another ill *Accident* is, *Drouth*, at the *Spindling* of the *Corne*; Which with vs is rare; But in Hotter *Countries*, common: Inſomuch as the Word, *Calamitas*, was firſt deri- ued from *Calamus*, when the *Corne* could not get out of the *Stalke*. An- other ill *Accident* is, *Over-wet* at *Sowing-Time*; which with vs breedeth much *Dearth*; Inſomuch as the *Corne* neuer commeth vp; And (many times) they are forced to reſow *Sommer-Corne*, where they ſowed *Win- ter-Corne*. Another ill *Accident* is *Bitter Froſts*, continued, without *Snow*; Eſpecially in the Beginning of the *Winter*, after the *Seed* is new Sown. Another *Disease* is *Wormes*; which ſometimes breed in the *Root*, and happen vpon Hot *Sunnes*, and *Showers*, immediately after the *Sowing*; And another *Worme* breedeth in the *Eare* it ſelfe; Eſpecially when Hot *Sunnes* breake often out of *Clouds*. Another *Disease* is *Weeds*; And they are ſuch, as either Choake, and Ouer-shadow the *Corne*, and beare it downe; Or ſtarue the *Corne*, and deceue it of Nouriſhment. Another *Disease* is, *Ouer-Ranckneſſe* of the *Corne*; Which they uſe to remedy, by *Mowing* it after it is come vp; Or putting *Sheepe* into it. Another ill *Accident* is *Laying* of *Corne* with great *Raines*, neare, or in *Harneſt*. An- other ill *Accident* is, if the *Seed* happen to haue touched *Oyle*, or any *Thing*, that is *Fat*; For thoſe *Subſtances* haue an *Antipathy* with *Nou- riſhment* of *Water*.

The *Remedies* of the *Diseases* of *Corne* haue beene obſerued as fol- loweth. The *Steeping* of the *Graine*, before *Sowing*, a little time in *Wine*, is thought a *Preſervative*: The *Mingling* of *Seed-Corne* with *Aſhes*, is thought to be good: The *Sowing* at the *Wane* of the *Moone*, is thought to make the *Corne* ſound: It hath not beene practiſed, but it is thought to bee of uſe, to make ſome *Miſcellane* in *Corne*; As if you ſow a few *Beanes* with *Wheat*; your *Wheat* will be the better. It hath beene obſerued, that the *Sowing* of *Corne* with *Houſleeke*, doth good. Though *Graine*, that



toucheth *Oile*, or *Fat*, receiueh hurt, yet the *Steeping* of it, in the *Dregs* of *Oile*, when it beginneth to *Putrifie*, (which they call *Amurca*,) is thought to assure it against *Wormes*. It is reported also, that if *Corne* be *Mowed*, it will make the *Graine* Longer, but *Emptier*, and hauing More of the *Flawke*.

671 It hath beene noted, that *Seed* of a yeere old, is the Best; And of two or three yeeres is Worse; And that which is more Old, is quite Barren; Though (no doubt) some *Seeds* and *Graines* last better than others. The *Corne*, which in the *Fanning* lieth lowest, is the best; And the *Corne*, which broken or bitten retaineth a little *Yellownesse*, is better than that which is very *White*.

672 It hath beene obserued, that of all *Roots* of *Herbs*, the *Root* of *Sorrell* goeth the furthest into the *Earth*; Inso much as it hath beene knowne to goe three *Cubits* deepe; And that it is the *Root* that continueth fit (longest) to be set againe, of any *Root* that groweth. It is a *Cold* and *Acide* *Herbe*, that (as it seemeth) loueth the *Earth*, and is not much drawne by the *Sunne*.

673 It hath beene obserued, that some *Herbs* like best, being watered with *Salt-water*; As *Radish*, *Beet*, *Rew*, *Pennyroyall*; This Triall would be extended to some other *Herbs*; Especially such as are Strong; As *Tarragon*, *Mustard-Seed*, *Rocket*, and the like.

674 It is strange that is generally receiued, how some *Poysonous Beasts* affect *Odorate* and *Wholesome Herbs*; As that the *Snake* loueth *Fennell*; That the *Toad* will be much vnder *Sage*; That *Frogs* will be in *Cinquefoile*. It may be, it is rather the *Shade*, or other *Couerture*, that they take liking in, than the *Vertue* of the *Herbe*.

675 It were a Matter of great Profit, (saue that I doubt it is too Coniecturall to venture vpon,) if one could discerne, what *Corne*, *Herbs*, or *Fruits*, are like to be in *Plenty*, or *Scarcity*, by some *Signes* and *Prognosticks*, in the Beginning of the Yeere: For as for those, that are like to bee in *Plenty*, they may be bargained for, vpon the *Ground*; As the Old Relation was of *Thales*; who to shew how easie it was for a *Philosopher* to be rich, when he fore-saw a great *Plenty* of *Olines*, made a *Monopoly* of them. And for *Scarcity*, Men may make Profit in keeping better the old Store. Long Continuance of *Snow* is beleued to make a *Fruitfull Yeere* of *Corne*: An *Early Winter*, or a very *Late Winter*, a *Barren Yeere* of *Corne*: An *Open* and *Serene Winter*, an ill Yeere of *Fruit*: These we haue partly touched before: But other *Prognosticks* of like Nature are diligently to be enquired.

676 There seeme to be, in some *Plants*, *Singularities*, wherein they differ from all Other; The *Oline* hath the *Oily Part*, only on the *Outside*; Whereas all other *Fruits* haue it in the *Nut*, or *Kernell*. The *Firre* hath (in effect) no *Stone*, *Nut*, nor *Kernell*; Except you will count the little *Graines* *Kernels*. The *Pomegranate* and *Pine-Apple* haue onely, amongst *Fruits*, *Graines* distinct in severall Cells. No *Herbs* haue *Curled Leanes*, but *Cabbage*, and *Cabbage-Lettuce*. None haue double *Leanes*, one belonging to the



the *Stalke*, another to the *Fruit* or *Seed*, but the *Artichoake*: No *Flower* hath that kinde of *Spread* that the *Woodbine* hath. This may be a large *Field of Contemplation*; For it sheweth that in the *Frame of Nature*, there is, in the *Producing* of some *Species*, a *Composition* of *Matter*, which happeneth oft, and may be much diuersified: In others, such as happeneth rarely, and admitteth little *Variety*: For so it is likewise in *Beasts*: *Dogs* haue a *Resemblance* with *Wolues*, and *Foxes*; *Horses* with *Asses*, *Kine* with *Bufles*; *Hares* with *Conies*; &c. And so in *Birds*: *Kites* and *Kestrells* haue a *Resemblance* with *Hawkes*; *Common-Doves* with *Ring-Doves*, and *Turtles*; *Black-Birds* with *Thrushes* and *Mauisses*; *Crowes* with *Rauens*, *Dawes*, and *Choughes*, &c. But *Elephants*, and *Swine* amongst *Beasts*; And the *Bird of Paradise*, and the *Peacocke* amongst *Birds*; And some few others; haue scarce any other *Species*, that haue *Affinity* with them.

Wee leaue the *Description* of *Plants*, and their *Vertues*, to *Herballs*, and other like *Bookes of Naturall History*: Wherein *Mens diligence* hath beene great, euen to *Curiosity*: For our *Experiments* are only such, as doe euer ascend a *Degree*, to the *Deriuing* of *Causes*, and *Extracting* of *Axiomes*, which, wee are not ignorant, but that some, both of the *Ancient*, and *Moderne Writers*, haue also laboured; But their *Causes*, and *Axiomes*, are so full of *Imagination*, and so infected with the old *Receiued Theories*, as they are meere *Inquinations* of *Experience*, and Concoct it not.

IT hath beene obserued, by some of the *Ancients*, that *Skins*, (especially of *Rams*), newly pulled off, and applied to the *Wounds* of *Stripes*, doe keepe them from *Swelling*, and *Exulcerating*; And likewise Heale them, and Close them vp; And that the *Whites* of *Egs* doe the same. The *Cause*, is a *Temperate Conglutination*; For both *Bodies* are *Clammy*, and *Viscous*, and doe bridle the *Deflux* of *Humours* to the *Hurts*, without *Penning* them in too much.

YOU may turne (almost) all *Flesh* into a *Fatty Substance*, if you take *Flesh*, and cut it into *Peeces*, and put the *Peeces* into a *Glasse* couered with *Parchment*; And so let the *Glasse* stand six or seuen *Houres* in *Boyling Water*. It may be an *Experiment* of *Profit*, for *Making* of *Fat*, or *Grease* for many vses; But then it must be of such *Flesh* as is not *Edible*; As *Horses*, *Dogs*, *Bears*, *Foxes*, *Badgers*, &c.

IT is reported by one of the *Ancients*, that *New Wine*, put into *Vessels* well stopped, and the *Vessels* let downe into the *Sea*, will accelerate very much, the *Making* of them *Ripe* and *Potable*. The same would be tried in *Wore*.

Experiment  
Solitary touching  
Healing  
of Wounds.

677

Experiment  
Solitary touching  
Fat diffused  
in Flesh.

678

Experiment  
Solitary touching  
Ripening  
of Drink before  
the Time.

679



Experiment  
Solitary tou-  
ching *Pilosity*  
and *Plumage*.

680

**B**easts are more *Hairy* than Men; And *Savage Men* more than *Civill*; And the *Plumage* of *Birds* exceedeth the *Pilosity* of *Beasts*. The Cause of the Smoothnesse in Men, is not any Abundance of *Heat*, and *Moisture*, though that indeed causeth *Pilosity*; But there is requisite to *Pilosity*, not so much *Heat* and *Moisture*, as *Excrementitious Heat* and *Moisture*: (For whatsoever assimilateth, goeth not into the *Haire*:) And *Excrementitious Moisture* aboundeth most in *Beasts*, and Men that are more *Savage*. Much the same Reason is there of the *Plumage* of *Birds*; For *Birds* assimilate lesse, and exerne more than *Beasts*: For their *Excrements* are ever liquid, and their *Flesh* (generally) more dry: Besides; they have not *Instruments* for *Urine*; And so all the *Excrementitious Moisture* goeth into the *Feathers*: And therefore it is no Marvell, though *Birds* bee commonly better Meat than *Beasts*, because their *Flesh* doth assimilate more finely, and secerneth more subtilly. Againe, the *Head* of *Man* hath *Haire* vpon the *first Birth*, which no other *Part* of the *Body* hath. The Cause may be *Want* of *Perspiration*: For Much of the Matter of *Haire*, in the other *Parts* of the *Body*, goeth forth by *Insensible Perspiration*; And besides, the *Skull* being of a more solid Substance, nourisheth and assimilateth lesse, and excerneth more: And so likewise doth the *Chinne*; We see also that *Haire* commeth not vpon the *Palms* of the *Hands*, nor *Soales* of the *Feet*; Which are *Parts* more *Perspirable*. And *Children* likewise are not *Hairy*, for that their *Skins* are more *Perspirable*.

Experiment  
Solitary tou-  
ching the  
Quicknesse of  
Motion in  
*Birds*.

681

**B**irds are of *Swifter Motion* than *Beasts*: For the *Flight* of many *Birds* is *Swifter*, than the *Race* of any *Beasts*. The Cause is, for that the *Spirits* in *Birds*, are in greater Proportion, in comparison of the Bulke of their *Body*, than in *Beasts*: For as for the Reason that some giue, that they are partly Carried, whereas *Beasts* goe, that is Nothing; For by that Reason *Swimming* should be swifter, than *Running*: And that *Kinde* of *Carriage* also, is not without Labour of the *Wing*.

Experiment  
Solitary tou-  
ching the differ-  
ent Cleerenesse  
of the Sea.

682

**T**he Sea is *Cleerer*, when the *North-wind* bloweth, than when the *South-wind*. The Cause is, for that *Salt-water* hath a little *Oiliness* in the *Surface* thereof; As appeareth in very Hot daies: And againe, for that the *Southerne Wind* relaxeth the *Water* somewhat; As no *Water Boiling* is so *Cleere* as *Cold Water*.

Experiment  
Solitary tou-  
ching the differ-  
ent Heats of  
*Fire* and *Boiling*  
*Water*.

683

**F**ire burneth *Wood*, making it first *Luminous*; Then *Blacke* and *Brittle*; And lastly, *Broken* and *Incinerate*: *Scalding Water* doth none of these. The Cause is, for that by *Fire*, the *Spirit* of the *Body* is first *Refined*, & then *Emitted*; Wherof the *Refining*, or *Attenuation* causeth the *Light*; And the *Emission*, first the *Fragility*, and after the *Dissolution* into *Ashes*: Neither doth any other *Body* enter: But in *Water* the *Spirit* of the *Body* is not *Refined* so much; And besides *Part* of the *Water* entreteth; Which doth increase the *Spirit*, and in a degree extinguish it: Therefore we see that



that *Hot Water* will quench *Fire*. And againe wee see, that in *Bodies*, wherein the *Water* doth not much enter, but only the *Heat* passeth, *Hot Water* worketh the Effects of *Fire*: As in *Egges* *Boyled*, and *Roasted*, (into which the *Water* entreth not at all) there is scarce difference to be discerned; But in *Fruit*, and *Flesh*, whereinto the *Water* entreth, in some Part, there is much more difference.

**T**He *Bottom* of a *Vessel* of *Boyling Water*, (as hath beene obserued) is not very much *Heated*; So as Men may put their *Hand* vnder the *Vessel*, and remoue it. The *Cause* is, for that the *Moisture* of *Water*, as it quencheth *Coales*, where it entreth; So it doth allay *Heat*, where it toucheth: And therefore note well, that *Moisture*, although it doth not passe thorow *Bodies*, without *Communication* of some *Substance*, (As *Heat* and *Gold* doe;) yet it worketh manifest Effects; not by Entrance of the *Body*, but by Qualifying of the *Heat*, and *Cold*; As wee see in this *Instance*: And we see likewise, that the *Water* of *Things* distilled in *Water*, (which they call the *Bath*) differeth not much from the *Water* of *Things* Distilled by *Fire*: We see also, that *Pewter-Dishes*, with *Water* in them, will not Melt easily; But without it, they will: Nay we see more, that *Butter*, or *Oyle*, which in themselves are *Inflammable*, yet by Vertue of their *Moisture*, will doe the like.

**I**T hath beene noted by the *Ancients*, that it is dangerous to Picke ones *Eare*, whilest he *Yawneth*. The *Cause* is, for that in *Yawning*, the *Inner Parchment* of the *Eare* is extended, by the *Drawing* in of the *Spirit*, and *Breath*; For in *Yawning*, and *Sighing* both, the *Spirit* is first strongly Drawne in, and then strongly Expelled.

**I**T hath beene obserued by the *Ancients*, that *Sneezing* doth cease the *Hiccough*. The *Cause* is, for that the *Motion* of the *Hiccough*, is a *Lifting* up of the *Stomacke*; which *Sneezing* doth somewhat depresse, and diuert the *Motion* another way. For first we see, that the *Hiccough* commeth of *Fulnesse of Meat*, (especially in *Children*) which causeth an Extension of the *Stomacke*: We see also, it is caused by *Acide Meats*, or *Drinkes*, which is by the *Pricking* of the *Stomacke*: And this *Motion* is ceased, either by *Diuerfion*; Or by *Detention* of the *Spirits*: *Diuerfion*, as in *Sneezing*; *Detention*, as we see *Holding* of the *Breath*, doth helpe somewhat to cease the *Hiccough*: And putting a Man into an *Earnest Study* doth the like; As is commonly vsed: And *Vinegar* put to the *Nosthrills*, or *Gargarized*, doth it also; For that it is *Astringent*, and inhibiteth the *Motion* of the *Spirits*.

**L**ooking against the *Sunne*, doth induce *Sneezing*. The *Cause* is, not the *Heating* of the *Nosthrills*; For then the *Holding* up of the *Nosthrills* against the *Sunne*, though one *Winke*, would doe it; But the *Drawing* downe of the *Moisture* of the *Braine*: For it will make the *Eyes* run with

Experiment  
Solitary touching the  
Qualification of Heat  
by Moisture.

684

Experiment  
Solitary touching  
Yawning.

685

Experiment  
Solitary touching the  
Hiccough.

686

Experiment  
Solitary touching  
Sneezing.

687



*Water*; And the *Drawing* of *Moisture* to the *Eyes*, doth draw it to the *Nosthrils*, by *Motion* of *Consent*; And so followeth *Sneezing*; As contrariwise the *Tickling* of the *Nosthrils* within, doth draw the *Moisture* to the *Nosthrils*, and to the *Eyes* by *Consent*; For they also will *Water*. But yet it hath beene obserued, that if one be about to *Sneeze*, the *Rubbing* of the *Eyes*, till they run with *Water*, will preuent it. Whereof the *Cause* is, for that the *Humour*, which was descending to the *Nosthrils*, is diuer-  
ted to the *Eyes*.

Experiment  
Solitary tou-  
ching the Ten-  
dernesse of the  
Teeth.

688

**T**He *Teeth* are more, by *Cold Drinke*, or the like, affected, than the other *Parts*. The *Cause* is double: The One, for that the *Resistance* of *Bone* to *Cold*, is greater than of *Flesh*; for that the *Flesh* shrinketh, but the *Bone* resisteth, whereby the *Cold* becommeth more eager: The Other is, for that the *Teeth* are *Parts* without *Blond*, Whereas *Blond* helpeth to qualifie the *Cold*: And therefore we see, that the *Sinnewes* are much affected with *Cold*; For that they are *Parts* without *Blond*: So the *Bones* in Sharpe *Colds* wax *Brittle*; And therefore it hath beene scene, that all *Contusions* of *Bones*, in *Hard Weather*, are more difficult to *Cure*.

Experiment  
Solitary tou-  
ching the  
Tongue.

689

**I**T hath beene noted, that the *Tongue* receiueth, more easily, *Tokens* of *Diseases*, than the other *Parts*, As of *Heats* within, which appeare most in the *Blacknesse* of the *Tongue*. Againe, *Pied Castell* are spotted in their *Tongues*, &c. The *Cause* is (no doubt,) the *Tendernesse* of the *Part*; which thereby receiueth more easily all *Alterations*, than any other *Parts* of the *Flesh*.

Experiment  
Solitary tou-  
ching the Taste.

690

**V**When the *Mouth* is out of *Taste*, it maketh Things taste, sometimes *Salt*; Chiefly *Bitter*; And sometimes *Loathsome*; But neuer *Sweet*. The *Cause* is, the *Corrupting* of the *Moisture* about the *Tongue*; Which many times turneth *Bitter*, and *Salt*, and *Loathsome*; But *Sweet* neuer; For the rest are *Degrees* of *Corruption*.

Experiment  
Solitary tou-  
ching some  
Prognosticks of  
Pestilentiall  
Seasons.

691

**I**T was obserued in the *Great Plague* of the last Yeere, that there were scene, in diuers *Ditches*, and low *Grounds* about *London*, many *Toads*, that had *Tailes*, two or three Inches long, at the least: Whereas *Toads* (vsually) haue no *Tailes* at all. Which argueth a great *Disposition* to *Putrefaction* in the *Soile*, and *Aire*. It is reported likewise, that *Roots*, (such as *Carrets*, and *Parsnips*,) are more *Sweet*, and *Lushious*, in *Infectious* Yeeres, than in other Yeeres.

Experiment  
Solitary tou-  
ching Speciall  
Simples for  
Medicines.

692

**W**ile *Physicians* should with all diligence inquire, what *Simples* Na-  
ture yeeldeth, that haue extreme *Subtile Parts*, without any *Mor-  
dication*, or *Acrimony*: For they *Vndermine* that which is *Hard*; They  
open that which is *Stopped*, and *Shut*; And they expell that which is  
*Offensive*, gently, without too much *Perturbation*. Of this Kinde are  
*Elder-Flowers*, which therefore are Proper for the *Stone*: Of this kinde



is the *Dwarfe-Pine*; which is Proper for the *Jaundies*: Of this kinde is *Harts-Horne*; which is Proper for *Agues*. and *Infections*: Of this kinde is *Piony*; which is Proper for *Stoppings* in the *Head*: Of this kind is *Fumitory*; which is Proper for the *Spleene*: And a Number of Others. Generally, diuers *Creatures* bred of *Putrefaction*, though they be somewhat loathsome to take, are of this kinde; As *Earth-wormes*, *Timber-Sowes*, *Snailles*, &c. And I conceiue, that the *Trochischs* of *Vipers*, (which are so much magnified,) and the *Flesh* of *Snakes* some waies condited, and corrected, (which of late are growne into some *Credite*,) are of the same Nature. So the *Parts* of *Beasts* *Putrified*; (as *Castoreum*, and *Muske*, which haue extreme *Subtill Parts*,) are to be placed amongst them. We see also that *Putrefactions* of *Plants*, (as *Agaricke*, and *Iewes-Eare*,) are of greatest *Vertue*. The *Cause* is, for that *Putrefaction* is the *Subtillest* of all *Motions*, in the *Parts* of *Bodies*: And since we cannot take downe the *Lines* of *Liuing Creatures*, (which some of the *Paracelsians* say (if they could be taken downe,) would make vs *Immortal*;) the Next is for *Subtily* of *Operation*, to take *Bodies* *Putrified*; Such as may be safely taken.

**I**T hath beene obserued by the *Ancients*, that *Much Vse* of *Venus* doth *Dimme* the *Sight*; And yet *Eunuchs*, which are vnable to generate, are (neuerthelesse) also *Dimme Sighted*. The *Cause* of *Dimnesse* of *Sight*, in the Former, is the *Expence* of *Spirits*: In the Latter, the *Ouer-moisture* of the *Braine*: For the *Ouer-moisture* of the *Braine* doth thicken the *Spirits* *Visuall*, and obstructeth their *Passages*; As we see by the *Decay*, in the *Sight*, in *Age*; Where also the *Diminution* of the *Spirits* concurrereth as another *Cause*: wee see also that *Blindnesse* commeth by *Rheumes*, and *Cataracts*. Now in *Eunuchs*, there are all the *Notes* of *Moisture*; As the *Swelling* of their *Thighes*, the *Loosenesse* of their *Belly*, the *Smoothnesse* of their *Skinne*, &c.

The *Pleasure* in the *Act* of *Venus* is the the greatest of the *Pleasures* of the *Senses*: The *Matching* of it with *Itch* is vnproper; though that also be *Pleasing* to the touch. But the *Causes* are *Profound*. First, all the *Organs* of the *Senses* qualifie the *Motions* of the *Spirits*; And make so many seuerall *Species* of *Motions*, and *Pleasures* or *Displeasures* thereupon, as there be *Diuersities* of *Organs*. The *Instruments* of *Sight*, *Hearing*, *Taste*, and *Smell*, are of seuerall frame; And so are the *Parts* for *Generation*. Therefore *Scaliger* doth well, to make the *Pleasure* of *Generation* a *Sixth Sense*; And if there were any other differing *Organs*, and *Qualified Perforations*, for the *Spirits* to passe; there would be more than the *Five Senses*: Neither doe we well know, whether some *Beasts*, and *Birds*, haue not *Senses* that wee know not: And the very *Sent* of *Dogges* is almost a *Sense* by it selfe. Secondly, the *Pleasures* of the *Touche*, are greater and deeper, than those of the other *Senses*; As we see in *Warming* vpon *Cold*; Or *Refrigeration* vpon *Heat*: For as the *Paines* of the *Touche*, are greater than the *Offences* of other *Senses*; So likewise are the *Pleasures*. It is true, that the *Affecting* of the *Spirits* immediately, and (as it were) without an

Experiments  
in Consort tou-  
ching *Venus*.

693

694

Organ,



*Organ*, is of the greatest *Pleasure*; Which is but in two things: *Sweet Smells*; And *Wine*, and the like *Sweet Vapours*. For *Smells*, wee see their great and sudden Effect in fetching *Men* againe, when they swoone: For *Drinke*, it is certain, that the *Pleasure* of *Drunkenesse*, is next the *Pleasure* of *Venus*: And *Great Ioyes* (likewise) make the *Spirits* moue, and touch themselves: And the *Pleasure* of *Venus* is somewhat of the same *Kind*.

695

It hath beene alwayes obserued, that *Men* are more inclined to *Venus* in the *Winter*, and *Women* in the *Summer*. The *Cause* is, for that the *Spirits*, in a *Body* more Hot and dry, (as the *Spirits* of *Men* are,) by the *Summer* are more exhaled, and dissipated; And in the *Winter* more condensed, and kept entire: But in *Bodies* that are Cold and Moist, (as *Womens* are,) the *Summer* doth Cherish the *Spirits*, and calleth them forth; the *Winter* doth dull them. Furthermore, the *Abstinence*, or *Intermission* of the *Vse* of *Venus*, in *Moist* and well *Habituat* *Bodies*, breedeth a *Number* of *Diseases*; And especiall dangerous *Impostumations*. The Reason is euident; For that it is a Principall *Euacuation*, especially of the *Spirits*: For of the *Spirits*, there is scarce any *Euacuation*, but in *Venus*, and *Exercise*. And therefore the *Omission* of either of them, breedeth all *Diseases* of *Repletion*.

Experiments  
in Consort,  
touching the  
*Insecta*.

The *Nature* of *Viuiification* is very worthy the Enquiry: And as the *Nature* of *Things*, is commonly better perceiued, in *Small*, than in *Great*; and in vnperfect, than in perfect; and in *Parts*, than in whole: So the *Nature* of *Viuiification* is best enquired in *Creatures* bred of *Putrefaction*. The *Contemplation* whereof hath many *Excellent Fruits*. First, in *Disclosing* the *Originall* of *Viuiification*. Secondly, in *Disclosing* the *Originall* of *Figuration*. Thirdly, in *Disclosing* many *Things* in the *Nature* of *Perfect Creatures*, which in them lye more hidden. And Fourthly, in *Traducing*, by way of *Operation*, some *Observations* in the *Insecta*, to worke *Effects* vpon *Perfect Creatures*. Note that the word *Insecta*, agreeth not with the Matter, but we euer vse it for Breuities sake, intending by it *Creatures* bred of *Putrefaction*.

696

The *Insecta* are found to breed out of seuerall *Matters*: Some breed of *Mud*, or *Dung*; As the *Earth-Wormes*, *Eeles*, *Snakes*, &c. For they are both *Putrefactions*: For *Water* in *Mud* doth *Putrifie*, as not able to *Preserue* it selfe: And for *Dung*, all *Excrements* are the *Refuse* and *Putrefactions* of *Nourishment*. Some breed in *Wood*, both *Growing*, and *Cut down*. *Quare* in what *Woods* most, and at what *Seasons*? We see that the *Worms* with many *Feet*, which round themselves into *Balls*, are bred chiefly vnder *Logs* of *Timber*, but not in the *Timber*; And they are said to be found also, (many times,) in *Gardens*, where no *Logs* are. But it seemeth their

Generation



*Generation* requireth a *Couerture*, both from *Sunne*, and *Raine*, or *Dew*; As the *Timber* is; And therefore they are not *Venemous*, but (contrariwise) are held by the *Physitians* to clarify the *Blood*. It is obserued also that *Cimices* are found in the *Holes* of *Bed-Sides*. Some breed in the *Haire* of *Living Creatures*; As *Lice*, and *Tikes*; which are bred by the *Sweat* close kept, and somewhat arefed by the *Haire*. The *Excrements* of *Living Creatures*, doe not only breed *Insecta*, when they are *Excerned*, but also while they are in the *Body*; As in *Wormes*, whereto *Children* are most subiect, and are chiefly in the *Guts*. And it hath beene lately obserued by *Physitians*, that in many *Pestilent Diseases*, there are *Wormes* found in the vpper Parts of the *Body*, where *Excrements* are not, but only *Humours Putrified*. *Fleas* breed Principally of *Straw* or *Mats*, where there hath beene a little *Moisture*; Or the *Chamber* and *Bed-straw* kept close, and not *Aired*. It is receiued that they are killed by *Strewing Wormewood* in the *Rooms*. And it is truly obserued, that *Bitter Things* are apt, rather to kill, than engender *Putrefaction*; And they be *Things*, that are *Fat*, or *Sweet*, that are aptest to *Putrifie*. There is a *Worme*, that breedeth in *Meale*, of the shape of a large white *Magget*, which is giuen as a great *Dainty* to *Nightingales*. The *Moath* breedeth vpon *Cloth*, and other *Lanifices*; Especially if they be laid vp dankish, and wet. It delighteth to be about the *Flame* of a *Candle*. There is a *Worme* called a *Wenill*, bred vnder *Ground*, and that feedeth vpon *Roots*; As *Parsnips*, *Carrets*, &c. Some breed in *Waters*, especially shaded, but they must be *Standing-waters*; As the *Water-Spider*, that hath six *Legs*. The *Fly* called the *Gad-fly*, breedeth of somewhat that *Swim-meth* vpon the *Top* of the *Water*, and is most about *Ponds*. There is a *Worme* that breedeth of the *Dregs* of *Wine Decayed*; which afterwards, (as is obserued by some of the *Ancients*,) turneth into a *Gnat*. It hath bin obserued by the *Ancients*, that there is a *Worme* that breeds in old *Snow*, and is of *Colour Reddish*, and dull of *Motion*, and dieth soone after it commeth out of *Snow*. Which should shew, that *Snow* hath in it a secret *Warmth*; For else it could hard'y *Viuijie*. And the Reason of the *Dying* of the *Worme*, may be the sudden *Exhaling* of that little *Spirit*, as soone as it commeth out of the *Cold*, which had shut it in. For as *Butterflies* quicken with *Heat*, which were benumbed with *Cold*; So *Spirits* may exhale with *Heat*, which were Preserued in *Cold*. It is affirmed both by *Ancient* and *Moderne Observation*, that in *Furnaces* of *Copper*, and *Brasse*, where *Chalcites*, (which is *Vitrioll*,) is often cast in, to mend the working, there riseth suddenly a *Fly*, which sometimes moueth as if it tooke hold on the walls of the *Furnace*; Sometimes is seene mouing in the *Fire* below; And dieth presently, as soone as it is out of the *Furnace*. Which is a Noble *Instance*, and worthy to be weighed; for it sheweth that as well *Violent Heat* of *Fire*, as the *Gentle Heat* of *Living Creatures*, will *Viuijie*, if it haue Matter Proportionable. Now the great *Axiome* of *Viuiification* is, that there must be *Heat* to dilate the *Spirit* of the *Body*; An *Active Spirit* to be dilated; Matter *Viscous* or *Tenacious*, to hold in the *Spirit*; And that Matter to be put forth, and *Figured*. Now a *Spirit* dilated by so ardent a

Fire,



Fire, as that of the *Furnace*, as soone as euer it coolerh neuer so little, congealeth presently. And (no doubt) this *Action* is furthered by the *Chalcites*, which hath a *Spirit*, that will Put forth and germinate, as wee see in *Chymicall* Trialls. Briefly, most *Things Putrified* bring forth *Insecta* of seuerall Names; But wee will not take vpon vs now, to Enumerate them all.

697

The *Insecta* haue beene noted by the *Ancients*, to feed little: But this hath not beene diligently obserued; For *Grashoppers* eat vp the *Greene* of whole *Countries*; And *Silke-Wormes* deuoure *Leaves* swiftly; And *Ants* make great Prouision. It is true, that *Creatures*, that Sleepe and rest much, Eat little; As *Dormise*, and *Bats*, &c. They are all without *Bloud*: Which may be, for that the *Iuyce* of their *Bodies*, is almost all one; Not *Bloud*, and *Flesh*, and *Skin*, and *Bone*, as in *Perfect Creatures*; The *Integrall Parts* haue Extreme Variety, but the *Similar Parts* little. It is true, that they haue, (some of them,) a *Diaphragme*, and an *Intestine*; And they haue all *Skins*; Which in most of the *Insecta* are cast often. They are not (generally) of long *Life*: Yet *Bees* haue beene knowne to liue seuen yeares: And *Snakes* are thought, the rather for the *Casting* of their *Spoile*, to liue till they be Old: And *Eeles*, which many times breed of *Putrefaction*, will liue and grow very long: And those that Enterchange from *Wormes* to *Flyes* in the *Summer*, and from *Flyes* to *Wormes* in the *Winter*, haue beene kept in Boxes foure yeares at the least. Yet there are certaine *Flyes*, that are called *Ephemera*, that liue but a day. The *Cause* is, the Exility of the *Spirit*; Or perhaps the Absence of the *Sunne*; For that if they were brought in, or kept close, they might liue longer. Many of the *Insecta*, (as *Butterflies*, and other *Flyes*,) reuiue easily, when they seeme dead, being brought to the *Sunne*, or *Fire*. The *Cause* whereof is, the *Diffusion* of the *Vitall Spirit*, and the *Easie Dilating* of it by a little *Heat*. They stirre a good while, after their *Heads* are off, or that they be cut in *Peeeces*; which is caused also, for that their *Vitall Spirits* are more diffused thorow-out all their *Parts*, and lesse confined to *Organs*, than in *Perfect Creatures*.

698

The *Insecta* haue *Voluntary Motion*, and therefore *Imagination*; And whereas some of the *Ancients* haue said, that their *Motion* is Indeterminate, and their *Imagination* Indefinite, it is negligently obserued; For *Ants* goe right forwards to their *Hills*; And *Bees* doe (admirably) know the way, from a Flowry Heath, two or three Miles off, to their *Hucs*. It may be, *Gnats*, and *Flyes*, haue their *Imagination* more mutable, and giddy, as *Small Birds* likewise haue. It is said by some of the *Ancients*, that they haue only the *Sense* of *Feeling*; which is manifestly untrue: For if they goe forth-right to a Place, they must needs haue *Sight*: Besides they delight more in one *Flower*, or *Herb*, than in another, and therefore haue *Taste*: And *Bees* are called with *Sound* vpon *Brasse*, and therefore they haue *Hearing*: Which sheweth likewise that though their *Spirit* be diffused, yet there is a *Seat* of their *Senses* in their *Head*.

Other Observations concerning the *Insecta*, together with the Enumeration



tion of them, we referre to that Place, where we meane to handle the Title of Animal's in generall.

**A** Man Leapeth better with *Weights*, in his *Hands*, than without. The Cause is, for that the *Weight*, (if it be proportionable,) strengthneth the *Sinewes*, by *Contracting* them. For otherwise, where no *Contraction* is needfull, *Weight* hindereth. As we see in *Horse-Races*, Men are curious to fore-see, that there be not the least *Weight*, vpon the one *Horse*, more than vpon the other. In *Leaping* with *Weights*, the *Armes* are first cast backwards, and then forwards, with so much the greater Force: For the *Hands* goe backward before they take their Raife. *Quere*, if the contrary *Motion* of the *Spirits*, immediately before the *Motion* we intend, doth not cause the *Spirits*, as it were, to breake forth with more Force: As *Breath* also drawne, and kept in, commeth forth more forcibly: And in  *Casting* of any *Thing*, the *Arms*, to make a greater *Swing*, are first cast backward.

Experiment  
Solitary tou-  
ching *Leaping*.

699

**O**F *Musicall Tones*, and *Vnequall Sounds*, we haue spoken before; But touching the *Pleasure*, and *Displeasure* of the *Senses*, not so fully. *Harsh Sounds*, as of a *Saw*, when it is sharpened; *Grinding* of one *Stone* against another; *Squeaking*, or *Skriching Noise*; make a *Shinering* or *Horror* in the *Body*, and set the *Teeth* on edge. The Cause is, for that the *Obiects* of the *Eare*, doe affect the *Spirits* (immediately) most with *Pleasure* and *Offence*. We see, there is no *Colour* that affecteth the *Eye* much with *Displeasure*: There be *Sights*, that are *Horrible*, because they excite the *Memory* of *Things* that are *Odious*, or *Fearfull*; But the same *Things Painted* doe little affect. As for *Smells*, *Tastes*, and *Touches*, they be *Things* that doe affect, by a *Participation*, or *Impulsion* of the *Body*, of the *Obiect*. So it is *Sound* alone, that doth immediately, and incorporeally, affect most: This is most manifest in *Musike*; and *Concords* and *Discords* in *Musicke*: For all *Sounds*, whether they be sharpe, or Flat, if they be Sweet, haue a *Roundnesse* and *Equality*; And if they be Harsh, are *Vnequall*: For a *Discord* it selfe is but a *Harshnesse* of *Diuers Sounds Meeting*. It is true, that *Inequality*, not Stayed vpon, but *Passing*, is rather an *Encrease* of *Sweetnesse*; As in the *Purling* of a *Wreathed String*; And in the *Rancity* of a *Trumpet*; And in the *Nightingale-Pipe* of a *Regall*; And in a *Discord* straight falling vpon a *Concord*: But if you stay vpon it, it is *Offensive*; And therefore, there be these three *Degrees* of *Pleasing*, and *Displeasing* in *Sounds*; *Sweet Sounds*; *Discords*; and *Harsh Sounds*, which we call by diuers Names, as *Skriching*, or *Grating*, such as we now speake of. As for the *Setting* of the *Teeth* on *Edge*, we see plainly, what an *Intercourse* there is, betweene the *Teeth*, and the *Organ* of the *Hearing*, by the *Taking* of the *End* of a *Bow*, betweene the *Teeth*, and *Striking* vpon the *String*.

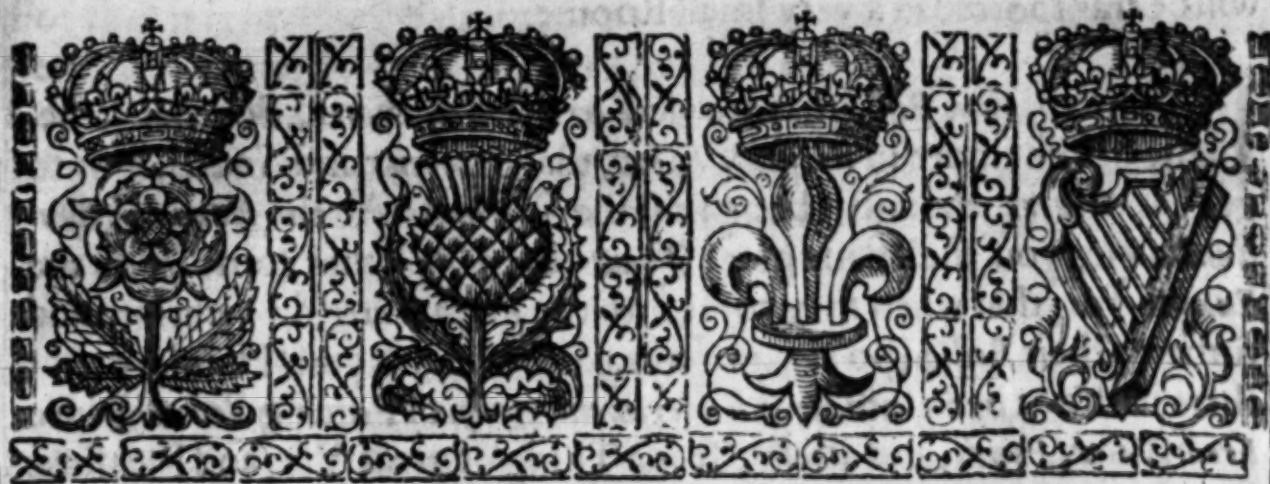
Experiment  
Solitary tou-  
ching the *Plea-  
sures*, and *Dis-  
pleasures* of the  
*Senses*, especi-  
ally of *Hearing*.

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# NATVRALL HISTORIE.

## VIII. Century.



Here be *Minerals*, and *Fossiles*, in great Varie-  
tie; But of *Veines* of *Earth Medicinall*, but  
few; The Chiefe are, *Terra Lemnia*, *Terra*  
*Sigillata communis*, and *Bolus Arminius*:  
Whereof *Terra Lemnia* is the Chiefe. The  
*Vertues* of them are, for *Curing* of *Wounds*,  
*Stanching* of *Bloud*, *Stopping* of *Fluxes* and  
*Rheumes*, and *Arresting* the *Spreading* of  
*Poison*, *Infection*, and *Putrefaction*: And they  
haue, of all other *Simples*, the *Perfected* and  
*Purest Quality* of *Drying*, with little or no *Mixture* of any other *Quality*.  
Yet it is true, that the *Bole-Arminicke* is the most *Cold* of them; And that  
*Terra Lemnia* is the most *Hot*; For which Cause, the *Island Lemnos*, where  
it is digged, was in the Old *Fabulous Ages* consecrated to *Vulcan*.

About the *Bottom* of the *Straights* are gathered great *Quantities* of  
*Sponges*, which are gathered from the *sides* of *Rocks*, being as it  
were a large, but tough, *Mosse*. It is the more to be noted, because that  
there be but few *Substances*, *Plant-like*, that grow deep within the *Sea*; For  
they are gathered sometimes fiftene *Fathom* deep; And when they are  
laid

Experiment  
Solitary tou-  
ching *Veines*  
of *Medicinall*  
*Earth*.

701

Experiment  
Solitary tou-  
ching the  
*Growth* of  
*Sponges*.

702



laid on Shore, they seeme to be of great Bulke ; But crushed together, will be transported in a very small Roome.

Experiment  
Solitary tou-  
ching Sea-Fish,  
put in Fresh  
Waters.

703

**I**T seemeth, that *Fish*, that are vsed to the *Salt-water*, doe neuertheless delight more in *Fresh*. We see, that *Salmons*, and *Smelts*, loue to get into *Rivers*, though it be against the *Streame*. At the *Hauen* of *Constantinople*, you shall haue great *Quantities* of *Fish* that come from the *Euxine-Sea*; that when they come into the *Fresh Water*, do inebriate and turne vp their *Bellies*; So as you may take them with your Hand. I doubt there hath not been sufficient *Experiment* made of Putting *Sea-Fish* into *Fresh Water*, *Ponds*, and *Pooles*. It is a Thing of great Vse, and Pleasure: For so you may haue them new at some good distance from the *Sea*: And besides, it may be, the *Fish* will eat the pleasanter, and may fall to breed: And it is said that *Colechester Oysters*, which are put into Pits, where the *Sea* goeth and commeth (but yet so, that there is a *Fresh Water* comming also to them, when the *Sea* voideth,) become by that meanes Fatter, and more Growne.

Experiment  
Solitary tou-  
ching Attraction  
by Similitude  
of Substance.

704

**T**He *Turkish-Bow* giueth a very Forcible *Shoot*; Insomuch as it hath bin known, that the *Arrow* hath pierced a *Steele Target*, or a Peece of *Brasse* of two Inches thicke: But that which is more strange, the *Arrow*, if it be Headed with *Wood*, hath beene knowne to pierce thorow a Peece of *Wood*, of eight Inches thicke. And it is certaine, that we had in vse at one time, for *Sea-Fight*, short *Arrowes*, which they called *Sprights*, without any other Heads, laue *Wood* sharpned; which were discharged out of *Muskets*, and would pierce thorow the Sides of *Ships*, where a *Bullet* would not pierce. But this dependeth vpon one of the greatest *Secrets* in all *Nature*; Which is, that *Similitude of Substance* will cause *Attraction*, where the Body is wholly freed from the *Motion* of *Gravity*: For if that were taken away, *Lead* would draw *Lead*, and *Gold* would draw *Gold*, and *Iron* would draw *Iron*, without the helpe of the *Load-Stone*. But this same *Motion* of *Weight* or *Gravity* (which is a meere *Motion* of the *Matter*, and hath no Affinity with the *Forme*, or *Kinde*,) doth kill the other *Motion*, except it selfe be killed by a violent *Motion*; As in these *Instances* of *Arrowes*; For then the *Motion* of *Attraction* by *Similitude of Substance*, beginneth to shew it selfe. But we shall handle this Point of *Nature* fully in due Place.

Experiment  
Solitary tou-  
ching certaine  
Drinckes in Tur-  
key.

705

**T**Hey haue in *Turkey*, and the *East*, certaine *Confections*, which they call *Serness*, which are like to *Candied Conserues*; And ate made of *Sugar* and *Lemons*, or *Sugar* and *Citrons*, or *Sugar* and *Violets*, and some other *Flowers*; And some Mixture of *Amber* for the more delicate *Persons*; And those they dissolue in *Water*, and thereof make their *Drinke*, because they are forbidden *Wine* by their *Law*. But I doe much maruell, that no *Englishman*, or *Dutchman*, or *German*, doth set vp *Brewing* in *Constantinople*; Considering they haue such *Quantity* of *Barley*. For as for the



the generall-Sort of *Men*, Frugality may be the Cause of *Drinking Water*; For that it is no small Saving, to pay nothing for ones *Drinke*: But the better Sort mought well be at the Cost. And yet I wonder the lesse at it, because I see *France*, *Italy*, or *Spaine*, haue not taken into vse, *Beere*, or *Ale*; Which (perhaps) if they did, would better both their *Healths*, and their *Complexions*. It is likely it would be Matter of great *Gain* to any, that should begin it in *Turkey*.

**I**N *Bathing* in *Hot Water*, *Sweat* (neuerthelesse) commeth not in the *Parts* vnder the *Water*. The Cause is; First, for that *Sweat* is a Kind of *Colligation*. And that Kind of *Colligation* is not made, either by an *Ouer-Dry Heat*, or an *Ouer-Moist Heat*. For *Ouer-Moisture* doth somewhat extinguish the *Heat*; As wee see that euen *Hot Water* quencheth *Fire*: And *Ouer-Dry Heat* shutteth the *Pores*: And therefore *Men* will sooner *Sweat* couered before the *Sunne*, or *Fire*, than if they stood *Naked*; And *Earthen Bottles*, filled with *Hot Water*, doe prouoke, in *Bed*, a *Sweat* more daintily, than *Brick-bats Hot*. Secondly, *Hot Water*, doth cause *Evaporation* from the *Skin*; So as it spendeth the Matter, in those *Parts* vnder the *Water*, before it issueth in *Sweat*. Againe, *Sweat* commeth more plentifully, if the *Heat* be increased by *Degrees*, than if it be greatest at first, or equall. The Cause is, for that the *Pores* are better opened by a *Gentle Heat*, than by a more *Violent*; And by their opening the *Sweat* issueth more abundantly. And therefore *Physitians* may do well, when they prouoke *Sweat* in *Bed*, by *Bottles*, with a *Decoction* of *Sudorificke Herbs* in *Hot Water*, to make two *Degrees* of *Heat* in the *Bottles*; And to lay in the *Bed*, the lesse *Heated* first, and after halfe an *Houre* the more *Heated*.

*Sweat* is *Salt* in Taste; The Cause is, for that, that *Part* of the *Nourishment*, which is *Fresh* and *Sweet*, turneth into *Bloud*, and *Flesh*; And the *Sweat* is only that *Part* which is *Separate* and *Exerued*. *Bloud* also *Raw* hath some *Saltnesse*, more than *Flesh*; because the *Assimilation* into *Flesh*, is not without a little and subtile *Excretion* from the *Bloud*.

*Sweat* commeth forth more out of the *Vpper Parts* of the *Body*, than the *Lower*; The Reason is, because those *Parts* are more replenished with *Spirits*; And the *Spirits* are they that put forth *Sweat*: Besides, they are lesse *Fleshy*, and *Sweat* issueth (chiefly) out of the *Parts* that are lesse *Fleshy*, and more *Dry*; As the *Forehead*, and *Breast*.

*Men* *Sweat* more in *Sleepe*, than *Waking*; And yet *Sleepe* doth rather stay other *Fluxions*, than cause them; As *Rheumes*, *Loosenesse* of the *Body*, &c. The Cause is, for that in *Sleepe*, the *Heat* and *Spirits* doe naturally moue inwards, and there rest. But when they are collected once within, the *Heat* becommeth more *Violent*, and *Irritate*; And thereby expelleth *Sweat*.

*Cold Sweats* are (many times) *Mortall*, and neere *Death*; And alwaies *Ill*, and *Suspected*; As in *Great Feares*, *Hypochondriacall Passions*, &c. The Cause is, for that *Cold Sweats* come by a *Relaxation* or *Forsaking* of the *Spirits*.

Experiments  
in Consort,  
touching *Sweat*

706

707

708

709

710



711

*Spirits*, whereby the *Moisture* of the Body, which *Heat* did keepe firme in the *Parts*, seuereth, and issueth out.

In those *Diseases* which cannot be discharged by *Sweat*, *Sweat* is ill, and rather to be stayed; As in *Diseases* of the *Lungs*, and *Fluxes* of the *Belly*; But in those *Diseases*, which are expelled by *Sweat*, it ealeth and lightneth; As in *Agues*, *Pestilences*, &c. The *Cause* is, for that *Sweat* in the Latter Sort is partly *Criticall*, and sendeth forth the *Matter* that offendeth; But in the Former, it either proceedeth from the *Labour* of the *Spirits*, which sheweth them Oppressed; Or from *Motion* of *Consent*, when *Nature* not able to expell the *Disease*, where it is seated, moueth to an *Expulsion* indifferent ouer all the *Body*.

Experiment  
Solitary touching the *Glo-worme*.

712

**T**He *Nature* of the *Glo-worme* is hitherto not well obserued. Thus much we see; That they breed chiefly in the *Hottest Moneths* of *Summer*; And that they breed not in *Champaigne*, but in *Bushes*, and *Hedges*. Whereby it may be conceiued, that the *Spirit* of them is very fine, and not to be refined, but by *Summer Heats*: And againe, that by reason of the *Finenesse*, it doth easily exhale. In *Italy*, and the *Hotter Countries*, there is a *Fly* they call *Lucciole*, that shineth as the *Glo-worme* doth; And it may be is the *Flying Glo-worme*. But that *Fly* is chiefly vpon *Fens*, and *Marrisbes*. But yet the two former *Observations* hold; For they are not seene, but in the *Heat* of *Summer*; And *Sedge*, or other *Greene* of the *Fens*, giue as good *Shade*, as *Bushes*. It may be the *Glo-wormes* of the *Cold Countries* ripen not so farre as to be *Winged*.

Experiments  
in Consort,  
touching the  
*Impressions*,  
which the *Passions* of the  
*Minde* make  
vpon the *Body*.

713

**T**He *Passions* of the *Minde*, worke vpon the *Body* the *Impressions* following. *Feare* causeth *Palenesse*; *Trembling*; The *Standing* of the *Haire* vpright; *Starting*; and *Skritchings*. The *Palenesse* is caused, for that the *Bloud* runneth inward, to succour the *Heart*. The *Trembling* is caused, for that through the *Flight* of the *Spirits* inward, the *Outward Parts* are destituted, and not sustained. *Standing Vpright* of the *Haire* is caused, for that by the *Shutting* of the *Pores* of the *Skin*, the *Haire* that lyeth afloat, must needs Rise. *Starting* is both an *Apprehension* of the *Thing feared*; (And, in that kinde, it is a *Motion* of *Shrinking*;) And likewise an *Inquisition*, in the beginning, what the *Matter* should be; (And in that kinde it is a *Motion* of *Erection*;) And therefore, when a *Man* would listen suddenly to any *Thing*, he *Starteth*; For the *Starting* is an *Erection* of the *Spirits* to attend. *Skitching* is an *Appetite* of *Expelling* that which suddenly striketh the *Spirits*: For it must be noted, that many *Motions*, though they be vnprofitable to expell that which hurteth, yet they are *Offers* of *Nature*, and cause *Motions* by *Consent*; As in *Groaning*, or *Crying* vpon *Paine*.

714

*Griefe* and *Paine* cause *Sighing*; *Sobbing*; *Groaning*; *Screaming*; and *Roaring*; *Teares*; *Distorting* of the *Face*; *Grinding* of the *Teeth*; *Sweating*. *Sighing* is caused by the *Drawing* in of a greater *Quantity* of *Breath* to refresh the *Heart* that laboureth: like a great *Draught* when one is thirsty.

*Sobbing*



*Sobbing* is the same Thing stronger. *Groaning*, and *Screaming*, and *Roaring*, are caused by an *Appetite* of *Expulsion*, as hath beene said: For when the *Spirits* cannot expell the Thing that hurteth, in their Strife to do it, by *Motion* of *Consent*, they expell the *Voice*. And this is, when the *Spirits* yeeld, and giue ouer to resist; For if one doe constantly resist *Paine*, he will not groane. *Teares* are caused by a *Contraction* of the *Spirits* of the *Braine*; Which *Contraction* by consequence astringeth the *Moisture* of the *Braine*, and thereby sendeth *Teares* into the *Eyes*. And this *Contraction*, or *Compression* causeth also *Wringing* of the *Hands*; For *Wringing* is a *Gesture* of *Expression*, of *Moisture*. The *Distorting* of the *Face* is caused by a *Contention*, first to beare and resist, and then to expell. Which maketh the *Parts* knit first, and afterwards open. *Grinding* of the *Teeth* is caused (likewise) by a *Gathering* and *Serring* of the *Spirits* together to resist; Which maketh the *Teeth* also to set hard one against another. *Sweating* is also a *Compound Motion* by the *Labour* of the *Spirits*, first to resist, and then to expell.

*Ioy* causeth a *Cherfulnessse*, and *Vigour* in the *Eyes*; *Singing*; *Leaping*; *Dancing*; And sometimes *Teares*. All these are the *Effects* of the *Dilatation*, and *Comming* forth of the *Spirits* into the *Outward Parts*; Which maketh them more *Liuely*, and *Stirring*. We know it hath beene scene, that *Excessiue Sudden Ioy*, hath caused *Present Death*, while the *Spirits* did spread so much, as they could not retire againe. As for *Teares*, they are the *Effects* of *Compression* of the *Moisture* of the *Braine*, vpon *Dilatation* of the *Spirits*. For *Compression* of the *Spirits* worketh an *Expression* of the *Moisture* of the *Braine*, by *Consent*, as hath beene said in *Griefe*. But then in *Ioy*, it worketh it diuersly; viz. by *Propulsion* of the *Moisture*, when the *Spirits* dilate, and occupy more *Roome*.

*Anger* causeth *Palenesse* in some, and the *Going* and *Comming* of the *Colour* in Others: Also *Trembling* in some; *Swelling*; *Foaming* at the *Mouth*; *Stamping*; *Bending* of the *Fist*. *Palenesse*, and *Going*, and *Comming* of the *Colour*, are caused by the *Burning* of the *Spirits* about the *Heart*; Which to refresh themselves call in more *Spirits* from the *Outward Parts*. And if the *Palenesse* be alone, without *Sending forth* the *Colour* againe, it is commonly ioyned with some *Feare*; But in many there is no *Palenesse* at all, but contrariwise *Rednesse* about the *Cheekes*, and *Gills*; Which is by the *Sending forth* of the *Spirits* in an *Appetite* to *Reuenge*. *Trembling* in *Anger* is likewise by a *Calling in* of the *Spirits*; And is commonly, when *Anger* is ioyned with *Feare*. *Swelling* is caused, both by a *Dilatation* of the *Spirits* by *Over-Heating*, and by a *Liquefaction* or *Boyling* of the *Humours* thereupon. *Foaming* at the *Mouth* is from the same *Cause*, being an *Ebullition*. *Stamping*, and *Bending* of the *Fist*, are caused by an *Imagination* of the *Act* of *Reuenge*.

*Light Displeasure* or *Dislike*, causeth *Shaking* of the *Head*; *Frowning*, and *Knitting* of the *Browes*. These *Effects* arise from the same *Causes* that *Trembling*, and *Horror* doe; Nimeely, from the *Retiring* of the *Spirits*, but in a lesse degree. For the *Shaking* of the *Head* is but a *Slow* and

715

716

717



Definite Trembling; And is a Gesture of Slight Refusall: And we see also, that a Dislike causeth (often) that Gesture of the Hand, which wee vse when we refuse a Thing, or wane it away. The Frowning, and Knitting of the Browes, is a Gathering, or Serring of the Spirits, to resist in some Measure. And we see also, this Knitting of the Browes will follow vpon earnest Studying, or Cogitation of any Thing, though it bee without Dislike.

718

Shame causeth Blushing; And Casting downe of the Eyes. Blushing is the Resort of Bloud to the Face; Which in the Passion of Shame is the Part that labourerh most. And although the Blushing will be seene in the whole Breast, if it be Naked, yet that is but in Passage to the Face. As for the Casting downe of the Eyes, it proceedeth of the Reuerence, a Man beareth to other Men; Whereby, when he is ashamed, he cannot endure to looke firmly vpon Others: And we see that Blushing, and the Casting downe of the Eyes both, are more when we come before Many; Ore Pompeij quid mollius? Nunquam non coram pluribus erubuit: And likewise when we come before Great, or Reuerend Persons.

719

Pity causeth sometimes Teares; And a Flexion or Cast of the Eye aside. Teares come from the same Cause that they doe in Griefe: for Pity is but Griefe in Anothers Behalfe. The Cast of the Eye is a Gesture of Auerfion, or Lothnesse to behold the Obiect of Pity.

720

Wonder causeth Astonishment; or an Immoueable Posture of the Body; Casting vp of the Eyes to Heauen; And Lifting vp of the Hands. For Astonishment, it is caused by the Fixing of the Minde vpon one Obiect of Cogitation, whereby it doth not spaciare and transcurrer, as it vsesh; For in Wonder the Spirits fly not, as in Feare; But onely settle, and are made lesse apt to moue. As for the Casting vp of the Eyes, and Lifting vp of the Hands, it is a Kinde of Appeale to the Deity; Which is the Author, by Power, and Providence, of Strange Wonders.

721

Laughing causeth a Dilatation of the Mouth, and Lips; A Continued Expulsion of the Breath, with the loud Noise, which maketh the Interjection of Laughing; Shaking of the Breast, and Sides; Running of the Eyes with Water, if it be Violent, and Continued. Wherein first it is to be understood, that Laughing is scarce (properly) a Passion, but hath his Source from the Intellect; For in Laughing there euer precedeth a Concoit of somewhat Ridiculous. And therefore it is Proper to Man. Secondly, that the Cause of Laughing is but a Light Touch of the Spirits, and not so deepe an Impression as in other Passions. And therefore (that which hath no Affinity with the Passions of the Minde,) it is moued, and that in great vehemency, onely by Tickling some Parts of the Body: And we see that Men euen in a Griued State of Minde, yet cannot sometimes forbear Laughing. Thirdly, it is euer ioyned with some Degree of Delight: And therefore Exhilaration hath some Affinity with Ioy, though it be a much Lighter Motion: Res seueræ est verum Gaudium. Fourthly, that the Obiect of it is Deformity, Absurdity, Shrew'd Turnes, and the like. Now to speake of the Causes of the Effects before mentioned, whereunto these

Generall



*Generall Notes* giue some *Light*. For the *Dilatation* of the *Mouth* and *Lips*, *Continued Expulsion* of the *Breath* and *Voice*, and *Shaking* of the *Breast* and *Sides*, they proceed (all) from the *Dilatation* of the *Spirits*; Especially being *Sudden*. So likewise, the *Running* of the *Eyes* with *Water*, (as hath beene formerly touched, where we spake of the *Tearres* of *Joy* and *Griefe*;) is an *Effect* of *Dilatation* of the *Spirits*. And for *Suddenesse*, it is a great *Part* of the *Matter*: For we see, that any *Shrew'd Turne* that lighteth vpon Another; Or any *Deformitie*, &c. moueth *Laughter* in the *Instant*; Which after a little time it doth not. So we cannot *Laugh* at any *Thing* after it is *Stale*, but whilest it is *New*: And euen in *Tickling*, if you *Tickle* the *Sides*, and giue warning; Or giue a *Hard* or *Continued Touch*, it doth not moue *Laughter* so much.

*Lust* causeth a *Flaunerie* in the *Eyes*; and *Priapisme*. The *Cause* of both these is, for that in *Lust*, the *Sight*, and the *Touch*, are the *Things* desired: And therefore the *Spirits* resort to those parts, which are most affected. And note well in generall, (For that great *Vfemay* be made of the *Observation*;) that (euermore) the *Spirits*, in all *Passions*, resort most to the *Parts*, that labour most, or are most affected. As in the last, which hath beene mentioned, they resort to the *Eyes*, and *Venerous Parts*: In *Fear*, and *Anger*, to the *Heart*: In *Shame* to the *Face*: And in *Light Dislikes* to the *Head*.

**I**T hath beene obserued by the *Ancients*, and is yet beleued, that the *Sperme* of *Drunken Men* is *Vnfruitfull*. The *Cause* is, for that it is *Overmoistened*, and wanteth *Spissitude*. And wee haue a merry Saying, that they that goe *Drunke* to *Bed*, get *Daughters*.

*Drunken Men* are taken with a plaine *Defect*, or *Destitution* in *Voluntary Motion*. They *Reele*; They *tremble*; They cannot stand, nor speake strongly. The *Cause* is, for that the *Spirits* of the *Wine*, oppresse the *Spirits Animall*, and occupate *Part* of the *Place*, where they are; And so make them *Weake* to moue. And therefore *Drunken Men* are apt to fall asleepe: And *Opiates*, and *Stupefactiues*, (as *Poppie*, *Henbane*, *Hemlocke*, &c.) induce a kinde of *Drunkenesse*, by the *Grossenesse* of their *Vapour*; As *Wine* doth by the *Quantitie* of the *Vapour*. Besides, they rob the *Spirits Animall* of their *Matter*, whereby they are nourished: For the *Spirits* of the *Wine* prey vpon it, as well as they: And so they make the *Spirits* lesse *Supple*, and *Apt* to moue.

*Drunken Men* imagine euery *Thing* turneth round; They imagine also that *Things* Come vpon them; They See not well *Things* a farre off; Those *Things* that they See neare hand, they See out of their *Place*; And (sometimes) they See *Things* double. The *Cause* of the *Imagination* that *Things* turne Round, is, for that the *Spirits* themselves turne, being compressed by the *Vapour* of the *Wine*: (For any *Liquid Body* vpon *Compression*, turneth, as we see in *Water*;) And it is all one to the *Sight*, whether the *Visuall Spirits* moue, or the *Object* moueth, or the *Medium* moueth. And we see that long *Turning Round* breedeth the same *Imagination*.

The

722

Experiments  
in Confort touching  
Drunken-  
nesse.

723

724

725



The Cause of the Imagination that Things come vpon them, is, for that the Spirits Visuall themselves draw backe; which maketh the Obiect seeme to come on; And besides, when they see Things turne Round, and Moue, Feare maketh them thinke they come vpon them. The Cause that they cannot see Things a farre off, is the Weaknesse of the Spirits; for in euery *Megrim*, or *Vertigo*, there is an *Obtenebration* ioyned with a Semblance of *Turning round*; Which we see also in the lighter Sort of *Swouings*. The Cause of Seeing things out of their Place, is the *Refraction* of the Spirits Visuall; For the Vapour is as an *Vnequall Medium*; And it is, as the Sight of Things, out of place, in *Water*. The Cause of Seeing Things double, is, the *Swift* and *Vaguer Motion* of the Spirits, (being Oppressed,) to and fro; For, (as was said before,) the Motion of the Spirits Visuall, and the Motion of the Obiect, make the same *Appearances*; And for the *Swift Motion* of the Obiect, we see, that if you fillip a *Lute-String*, it sheweth double, or *Treble*.

726

*Men* are sooner *Drunke* with *Small Draughts*, than with *Great*. And againe, *Wine Sugred* inebriateth lesse, than *Wine Pure*. The Cause of the Former is, for that the *Wine* descendeth not so fast to the *Bottom* of the *Stomach*; But maketh longer Stay in the *Vpper Part* of the *Stomach*, and sendeth *Vapours* faster to the *Head*; And therefore inebriateth sooner. And, for the same Reason, *Sops* in *Wine*, (Quantitie for Quantie,) inebriate more, than *Wine* of it selfe. The Cause of the Latter is, for that the *Sugar* doth inspissate the *Spirits* of the *Wine*, and maketh them not so easie to resolue into *Vapour*. Nay further, it is thought, to be some Remedie against *Inebriating*, if *Wine Sugred* be taken after *Wine Pure*. And the same Effect is wrought either by *Oyle*, or *Milke*, taken vpon much *Drinking*.

Experiment  
Solitary touch-  
ing the Helpe  
or Hurt of Wine,  
though Mode-  
rately used.

727

The Use of *Wine*, in *Drie*, and *Consumed Bodies*, is hurtfull; In *Moist*, and *Full Bodies*, it is good. The Cause is, for that the *Spirits* of the *Wine* do prey vpon the *Dew*, or *Radical Moisture*, (as they terme it) of the *Bodie*, and so deceiue the *Animall Spirits*. But where there is *Moisture* Enough, or *Superfluous*, there *Wine* helpeth to digest, and desiccate the *Moisture*.

Experiment  
Solitary touch-  
ing Caterpil-  
lers.

728

The *Caterpillar* is one of the most Generall of *Wormes*, and breedeth of *Dew*, and *Leaves*: For we see infinite Number of *Caterpillers*, which breed vpon *Trees*, and *Hedges*; By which the *Leaves* of the *Trees*, or *Hedges*, are in great Part consumed; As well by their Breeding out of the *Leafe*, as by their Feeding vpon the *Leafe*. They breed in the *Spring* chiefly, because then there is both *Dew*, and *Leafe*. And they breed commonly when the *East Winds* haue much blowne: The Cause whereof is, the *Driness* of that *Wind*: For to all *Vinification* vpon *Putrefaction*, it is requisite the *Matter* be not too *Moist*: And therefore we see, they haue *Copwebs* about them, which is a signe of a *Slimy Driness*: As we see vpon the *Ground*, whereupon, by *Dew*, and *Sunne*, *Copwebs* breed all ouer.

We



We see also the *Greene Catterpillar* breedeth in the Inward Parts of *Roses*, especially not blowne, where the *Dew* sticketh: But especially *Catterpillers*, both the greatest, and the most, breed vpon *Cabbages*, which haue a *Fat Lease*, and apt to *Putrisie*. The *Catterpillar* towards the *End* of *Summer* waxeth *Volatile*, and turneth to a *Butterfly*, or perhaps some other *Fly*. There is a *Catterpillar*, that hath a *Furre*, or *Downe* vpon him, and seemeth to haue *Affinitie* with the *Silke-worme*.

**T**He *Flyes Cantharides* are bred of a *Worme*, or *Catterpillar*, but peculiar to certaine *Fruit-Trees*; As are the *Fig-tree*, the *Pine-tree*, and the *Wilde Briar*; All which beare *Sweet Fruit*; And *Fruit* that hath a kinde of secret *Biting*, or *Sharpnesse*: For the *Fig* hath a *Milke* in it, that is *Sweet*, and *Corrosiue*: The *Pine-Apple* hath a *Kernell* that is *Strong* and *Abstersiue*: The *Fruit* of the *Briar* is laid to make *Children*, or those that Eat them, *Scabbed*. And therefore, no maruell though *Cantharides* haue such a *Corrosiue*, and *Canterizing Qualitie*; For there is not any other of the *Insecta*, but is bred of a *Duller Matter*. The *Body* of the *Cantharides* is bright coloured; And it may be, that the delicate-coloured *Dragon-Flyes*, may haue likewise some *Corrosiue Qualitie*.

**L**assitude is remedied by *Bathing*, or *Annointing* with *Oyle*, and *Warmed Water*. The *Cause* is, for that all *Lassitude* is a kinde of *Contusion*, and *Compression* of the *Parts*; And *Bathing*, and *Annointing* giue a *Relaxation*, or *Emollition*: And the *Mixture* of *Oyle*, and *Water*, is better than either of them alone; Because *Water* Entreth better into the *Pores*, and *Oyle* after Entry softneth better. It is found also that the *Taking* of *Tobacco* doth helpe and discharge *Lassitude*. The *Reason* whereof is, partly, because by *Chearing* or *Comforting* of the *Spirits*, it openeth the *Parts Compressed*, or *Contused*: And chiefly, because it refresheth the *Spirits* by the *Opiate Vertue* thereof; And so dischargeth *Wearinesse*; as *Sleepe* likewise doth.

In *Going up a Hill*, the *Knees* will be most *Weary*; In *Going downe a Hill*, the *Thighes*. The *Cause* is, for that, in the *Lift* of the *Feet*, when a Man *Goeth up the Hill*, the *Weight* of the *Body* beareth most vpon the *Knees*; And in *Going downe the Hill*, vpon the *Thighes*.

**T**He *Casting* of the *Skin*, is by the *Ancients* compared, to the *Breaking* of the *Secundine*, or *Call*; but not rightly: For that were to make euery *Casting* of the *Skin* a *New Birth*: And besides, the *Secundine* is but a generall *Couer*, not shaped according to the *Parts*; But the *Skin* is shaped according to the *Parts*. The *Creatures*, that cast their *Skin*, are; The *Snake*, the *Viper*, the *Grashopper*, the *Lizard*, the *Silke-worme*, &c. Those that cast their *Shell*, are; The *Lobster*, the *Crab*, the *Crawfish*, the *Hodman-dod* or *Dodman*, the *Tortoise*, &c. The *Old Skinnies* are found, but the *Old Shells* neuer: So as it is like, they scale off, and crumble away by degrees. And they are knowne, by the *Extreme Tendernesse* and *Softnesse* of

Experiment  
Solitary, touching the *Flyes Cantharides*.

729

Experiments  
in Consort, touching *Lassitude*.

730

731

Experiment  
Solitary touching the *Casting* of the *Skin*, and *Shell*, in some *Creatures*.

732



of the *New Shell*; And sometimes by the *Freshnesse* of the *Colour* of it. The *Cause* of the *Casting* of *Skin*, and *Shell*, should seeme to be the great *Quantitie* of *Matter* in those *Creatures*, that is fit to make *Skin*, or *Shell*; And againe, the *Loosenesse* of the *Skin*, or *Shell*, that sticketh not close to the *Flesh*. For it is certaine, that it is the *New Skin*, or *Shell*, that putteth off the *Old*: So we see, that in *Deere*, it is the *Young Horne*, that putteth off the *Old*; And in *Birds*, the *Young Feathers* put off the *Old*: And so *Birds*, that haue much *Matter* for their *Beake*, cast their *Beakes*; the *New Beake* Putting off the *Old*.

Experiments  
in Consort,  
touching the  
Postures of the  
Bodie.

733

**L**ying, not *Erect*, but *Hollow*, which is in the Making of the Bed; Or with the *Legs gathered up*, which is in the Posture of the Body, is the more *Wholesome*. The *Reason* is, the better *Comforting* of the *Stomach*, which is by that lesse *Penfile*: And we see, that in *WVake Stomachs*, the Laying vp of the *Legs high*, and the *Knees almost to the Mouth*, helpeth, and comforteth. We see also that *Gally-Slaves*, notwithstanding their *Misery* otherwise, are commonly *Fat and Fleshy*; And the *Reason* is, because the *Stomach* is supported somewhat in *Sitting*; And is *Penfile* in *Standing*, or *Going*. And therefore, for *Prolongation* of *Life*, it is good to choose those *Exercises*, where the *Limbes* moue more than the *Stomach*, and *Belly*; As in *Rowing*, and in *Sawing being Set*.

734

*Megrims* and *Giddinesse* are rather when we *Rise*, after long *Sitting*, than while we *Sit*. The *Cause* is, for that the *Vapours*, which were gathered by *Sitting*, by the *Sudden Motion*, fly more vp into the *Head*.

735

*Leaning long vpon any Part* maketh it *Numme*, and, as wee call it, *Asleepe*. The *Cause* is, for that the *Compression* of the *Part* suffereth not the *Spirits* to haue free *Accessse*; And therefore, when wee come out of it, wee feelee a *Stinging*, or *Pricking*; Which is the *Re-entrance* of the *Spirits*.

Experiment  
Solitary tou-  
ching *Pestilen-  
tian Yeares*.

736

**I**T hath beene noted, that those *Yeares* are *Pestilentiall*, and *Vnwhole-  
some*, when there are great *Numbers* of *Frogs*, *Flies*, *Locusts*, &c. The *Cause* is plaine; For that those *Creatures* being engendred of *Putrefacti-  
on*, when they abound, shew a generall *Disposition* of the *Yeare*, and *Con-  
stitution* of the *Aire*, to *Diseases* of *Putrefaction*. And the same *Prognos-  
ticke*, (as hath beene said before,) holdeth, if you finde *Wormes* in *Oake-  
Apples*. For the *Constitution* of the *Aire*, appeareth more subtilly, in any  
of these *Things*, than to the *Sense* of *Man*.

Experiment  
Solitary, tou-  
ching the *Prog-  
nostickes* of *Hard  
Winters*.

737

**I**T is an *Observation* amongst *Country-People*, that *Yeares* of *Store* of  
*Haws* and *Heps*, do commonly portend *Cold Winters*; And they ascribe  
it to *Gods Providence*, that, (as the *Scripture* saith) reacheth euen to the  
*Falling of a Sparrow*; And much more is like to reach to the *Preseruati-  
on* of *Birds* in such *Seasons*. The *Naturall Cause* also may be the *Want* of  
*Heat*, and *Abundance* of *Moisture*, in the *Summer* precedent; Which put-  
teth forth those *Fruits*, and must needs leaue great *Quantitie* of *Cold Va-  
pours*,



pours, not dissipate; Which causeth the Cold of the Winter following.

**T**hey haue in *Turkey*, a *Drinke* called *Coffa*, made of a *Berry* of the same Name, as Blacke as *Soot*, and of a *Strong Sent*, but not *Aromaticall*; Which they take, beaten into *Powder*, in *Water*, as Hot as they can drink: it: And they take it, and sit at it, in their *Coffa-Houses*, which are like our *Tavernes*. This *Drinke* comforteth the *Braine*, and *Heart*, and helpeth *Disgestion*. Certainly this *Berry Coffa*; The *Root*, and *Leafe Betel*; The *Leafe Tobacco*; And the *Teare of Poppy*, (*Opium*;) of which the *Turkes* are great *Takers*, (supposing it expelleth all *Feare*;) doe all *Condense the Spirits*, and make them *Strong*, and *Aleger*. But it seemeth they are taken after seuerall manners; For *Coffa* and *Opium* are taken downe; *Tobacco* but in *Smoke*; And *Betel* is but champed in the *Mouth*, with a little *Lime*. It is like there are more of them, if they were well found out, and well corrected. *Quare* of *Henbane-Seed*; Of *Mandrake*; Of *Saffron*, *Root*, and *Flower*; Of *Folium Indum*; Of *Amber-grice*; Of the *Assyrian Amomum*, if it may be had; And of the *Scarlet Powder*, which they call *Kermex*; And (generally) of all such Things, as doe inebriate, and prouoke *Sleepe*. Note that *Tobacco* is not taken in *Root*, or *Seed*, which are more forcible cuer than *Leaues*.

Experiment  
Solitary touching  
Medicines that  
Condense, and Re-  
leue the Spirits.

738

**T**he *Turkes* haue a *Blacke Powder*, made of a *Minerall* called *Alcobole*; Which with a fine long *Pencill* they lay vnder their *Eye-lids*; Which doth colour them *Blacke*; Whereby the *White* of the *Eye* is set off more *White*. With the same *Powder* they colour also the *Haires* of their *Eye-lids*, and of their *Eye-browes*, which they draw into *Embowed Arches*. You shall finde that *Xenophon* maketh *Mention*, that the *Medes* vsed to paint their *Eyes*. The *Turkes* vse with the same *Tincture*, to colour the *Haire* of their *Heads* and *Beards* *Blacke*: And diuers with vs, that are growne *Gray*, and yet would appeare *Young*, finde meanes to make their *Haire* blacke, by *Combing* it, (as they say,) with a *Leaden Combe*, or the like. As for the *Chineses*, who are of an ill *Complexion*, (being *Oliuaster*;) they paint their *Cheekes* *Scarlet*; Especially their *King*, and *Gravdes*. Generally, *Barbarous People*, that goe *Naked*, doe not only paint *Themselves*, but they powuce and raze their *Skinne*, that the *Painting* may not be taken soth. And make it into *Workes*. So doe the *West Indians*; And so did the *Ancient Picts*, and *Brittons*; So that it seemeth, *Men* would haue the *Colours* of *Birds Feathers*, if they could tell how; Or at least, they will haue *Gay Skins*, in stead of *Gay Cloathes*.

Experiment  
Solitary touching  
Paintings  
of the Body.

739

**I**t is strange, that the *Vse* of *Bathing*, as a *Part* of *Diet*, is left. With the *Romans*, and *Grecians*, it was as vsual, as *Eating*, or *Sleeping*: And so is it amongst the *Turkes* at this day: Whereas with vs it remaineth but as a *Part* of *Physicke*. I am of *Opinion*, that the *Vse* of it, as it was with the *Romans*, was hurtfull to *Health*; For that it made the *Body* *Soft*, and easie to *Waste*. For the *Turkes* it is more proper, because that their *Drinking*

Experiment  
Solitary touching  
the Vse  
of *Bathing* and  
*Annoynting*.

740



king Water, and Feeding vpon Rixe, and other Food of small Nourishment, maketh their Bodies so Solide, and Hard, as you need not feare that Bathing should make them Frostbie. Besides, the Turkes are great Sitters, and seldome walke; Whereby they Sweat lesse, and need Bathing more. But yet certaine it is, that Bathing, and especially Annointing, may be so vsed, as it may be a great Helpe to Health, and Prolongation of Life. But hereof we shall speake in due Place, when we come to handle Experiments Medicinall.

Experiment  
Solitary touching Chamo-  
letting of Paper.

741

**T**He Turkes haue a Pretty Art of Chamoletting of Paper, which is not with vs in vse. They take diuers Oyled Colours, and put them seuerally (in drops) vpon Water; And stirre the Water lightly; And then wet their Paper, (being of some Thicknesse,) with it; And the Paper will be Waued, and Veined, like Chamolet, or Marble.

Experiment  
Solitary touching Cattle-  
Inke.

742

**I**T is somewhat strange, that the Blood of all Birds, and Beasts, and Fishes, should be of a Red Colour, and only the Blood of the Cattle should be as Blacke as Inke. A Man would thinke, that the Cause should be the High Concoction of that Blood; For we see in ordinary Puddings, that the Boyling turneth the Blood to be Blacke; And the Cattle is accounted a delicate Meat, and is much in Request.

Experiment  
Solitary touching Increase  
of weight in  
Earth.

743

**I**T is reported of Credit, that if you take Earth, from Land adioyning to the River of Nile; And preserue it in that manner, that it neither come to be Wet, nor Wasted; And Weigh it daily, it will not alter Weight vntill the seuenteenth of Iune, which is the Day when the River beginneth to rise; And then it will grow more and more Ponderous, till the River commeth to his Heighth. Which if it be true, it cannot be caused, but by the Aire, which then beginneth to Condense; And so turneth within that Small Mould into a degree of Moisture; Which produceth Weight. So it hath bin obserued, that Tobacco, Cut, and Weighed, and then Dried by the Fire, loseth Weight; And after being laid in the open Aire, recouereth Weight againe. And it should seeme, that as soone as euer the River beginneth to increase, the whole Body of the Aire thereabouts suffereth a Change: For (that which is more strange,) it is credibly affirmed, that vpon that very Day, when the River first riseth, great Plagues, in Cairo, vse suddenly to breake vp.

Experiments  
in Consort,  
touching  
Sleepe.

744

**T**Hose that are very Cold, and especially in their Feet, cannot get to Sleepe. The Cause may be, for that in Sleepe is required a Free Respiration, which Cold doth shut in, and hinder: For wee see, that in great Colds, one can scarce draw his Breath. Another Cause may be, for that Cold calleth the Spirits to succour; And therefore they cannot so well close, and goe together in the Head; Which is euer requisite to Sleepe. And for the same Cause, Paine, and Noise hinder Sleepe; And Darknesse (contrariwise) furthereth Sleepe.

Some



Some *Noises* (wherof wee spake in the 112. *Experiment*) helpe *Sleepe*; As the *Blowing* of the *Wind*, the *Trickling* of *Water*, *Humming* of *Bees*, *Soft Singing*, *Reading*, &c. The *Cause* is, for that they moue in the *Spirits* a gentle *Attention*; And whatsoeuer moueth *Attention*, without too much *Labour*, stilleth the *Naturall* and *discursiue Motion* of the *Spirits*.

745

*Sleepe nourisheth*, or at least preserueth *Bodies*, a long time, without other *Nourishment*. *Beasts* that sleepe in *Winter* (as it is noted of *Wilde Beares*,) during their *Sleep* wax very *Fat*, though they *Eat* nothing. *Bats* haue beene found in *Ouens*, and other *Hollow Close Places*, Matted one vpon another; And therefore it is likely that they *Sleep* in the *Winter* time, and eat *Nothing*. *Quare*, whether *Bees* doe not *Sleep* all *Winter*, and spare their *Honey*? *Butterflies*, and other *Flies*, doe not onely *Sleepe*, but lye as *Dead* all *Winter*; And yet with a little *Heat* of *Sunne*, or *Fire*, reuiue againe. A *Dormouse*, both *Winter* and *Summer*, will *Sleepe* some daies together, and eat *Nothing*.

746

To restore *Teeth* in *Age*, were *Magnale Naturæ*. It may be thought of. But howsoeuer the *Nature* of the *Teeth* deserueth to be enquired of, as well as the other *Parts* of *Living Creatures Bodies*.

Experiments  
in Consort  
touching *Teeth*  
and *Hard Sub-*  
*stances* in the  
*Bodies* of *Living*  
*Creatures*.

There be *Fiue Parts* in the *Bodies* of *Living-Creatures*, that are of *Hard Substance*; The *Skull*; The *Teeth*; The *Bones*; The *Hornes*; and the *Nails*. The greatest *Quantity* of *Hard Substance* Continued, is towards the *Head*. For there is the *Skull* of one Entire *Bone*; There are the *Teeth*; There are the *Maxillary Bones*; There is the *Hard Bone*, that is the *Instrument* of *Hearing*; And thence issue the *Hornes*: So that the *Building* of *Living Creatures Bodies*, is like the *Building* of a *Timber-House*, where the *Walls* and other *Parts* haue *Columnes* and *Beames*; But the *Roofe* is, in the better Sort of *Houses*, all *Tile*, or *Lead*, or *Stone*. As for *Birds*, they haue *Three* other *Hard Substances* proper to them; The *Bill*, which is of like Matter with the *Teeth*; For no *Birds* haue *Teeth*: The *Shell* of the *Egge*: And their *Quils*: For as for their *Spurre*, it is but a *Nail*. But no *Living-Creatures*, that haue *Shells* very hard; (As *Oysters*, *Cockles*, *Mussels*, *Scallops*, *Crabs*, *Lobsters*, *Cra-Fish*, *Shrimps*, and especially the *Tortoise*,) haue *Bones* within them, but onely little *Gristles*.

747

*Bones*, after full *Growth*, continue at a *Stay*: And so doth the *Skull*: *Hornes*, in some *Creatures*, are cast and renewed: *Teeth* stand at a *Stay* except their *Wearing*: As for *Nails*, they grow continually: And *Bills* and *Beakes* will ouer-grow, and sometimes be cast; as in *Eagles*, and *Parrots*.

748

Most of the *Hard Substances* lye to the *Extremes* of the *Body*; As *Skull*, *Hornes*, *Teeth*, *Nails*, and *Beakes*: Only the *Bones* are more *Inward*, and clad with *Flesh*. As for the *Entrailes*, they are all without *Bones*; Saue that a *Bone* is (sometimes) found in the *Heart* of a *Stag*; And it may be in some other *Creature*.

749



750

The *Skull* hath *Braines*, as a kinde of *Marrow*, within it. The *Back-Bone* hath one Kinde of *Marrow*, which hath an Affinity with the *Braine*; And other *Bones* of the *Body* haue another. The *Jaw-Bones* haue no *Marrow* Scuered, but a little *Pulpe* of *Marrow* diffused. *Teeth* likewise are thought to haue a kinde of *Marrow* diffused, which causeth the *Sense*, and *Paine*: But it is rather *Sinnew*; For *Marrow* hath no *Sense*; No more than *Bloud*. *Horne* is alike thorowout; And so is the *Naile*.

751

None other of the *Hard Substances* haue *Sense*, but the *Teeth*: And the *Teeth* haue *Sense*, not onely of *Paine*, but of *Cold*.

But we will leaue the Enquiries of other *Hard Substances*, unto their seuerall *Places*; And now enquire onely of the *Teeth*.

752

The *Teeth* are, in *Men*, of three Kindes: *Sharpe*, as the *Fore-Teeth*; *Broad*, as the *Back-Teeth*, which we call the *Molar-Teeth*, or *Grinders*; And *Pointed Teeth*, or *Canine*, which are betweene both. But there haue beene some *Men*, that haue had their *Teeth* undiuided, as of one whole *Bone*, with some little Marke in the Place of the Diuision; as *Pyrrhus* had. Some *Creatures* haue *Ouer-long*, or *Out-growing Teeth*, which wee call *Fangs*, or *Tuokes*; As *Boares*, *Pikes*, *Salmons*, and *Dogs* though lesse. Some *Living Creatures* haue *Teeth* against *Teeth*; As *Men*, and *Horses*; And some haue *Teeth*, especially their *Master-Teeth*, indented one within Another, like *Sawes*; As *Lions*; And so againe haue *Dogs*. Some *Fishes* haue diuers *Rowes* of *Teeth* in the *Roofes* of their *Mouthes*; As *Pikes*, *Salmons*, *Trouts*, &c. And many more in *Salt-Waters*. *Snakes* and other *Serpents*, haue *Venomous Teeth*; which are sometimes mistaken for their *Sting*.

753

No *Beast* that hath *Hornes*, hath *Vpper Teeth*; And no *Beast*, that hath *Teeth* aboue, wanteth them below: But yet if they be of the same kinde, it followeth not, that if the *Hard Matter* goeth not into *Vpper Teeth*, it will goe into *Hornes*; Nor yet e conuerso; For *Doe's*, that haue no *Hornes*, haue no *Vpper Teeth*.

754

*Horses* haue, at three yeeres old, a *Tooth* put forth, which they call the *Colts Tooth*; And at foure yeeres old there commeth the *Mark-Tooth*, which hath a *Hole*, as big as you may lay a *Pease* within it; And that weareth shorter and shorter, euery yeere; Till that at eight yeeres old, the *Tooth* is smooth, and the *Hole* gone; And then they say; That the *Marke* is out of the *Horses Mouth*.

755

The *Teeth* of *Men* breed first, when the *Childe* is about a yeere and halfe old: And then they cast them, and new come about seuen yeeres old. But diuers haue *Back-ward Teeth* come forth at Twenty, yea some at Thirty, and Forty. *Quere* of the manner of the *Comming* of them forth. They tell a Tale of the old *Countesse* of *Desmond*, who liued till she was seuen-score yeeres old, that she did *Dentire*, twice, or thrice; Casting her old *Teeth*, and others *Comming* in their Place.

756

*Teeth* are much hurt by *Sweet-Meats*; And by *Painting* with *Mercury*; And by *Things Ouer-hot*; And by *Things Ouer-cold*; And by *Rheumes*. And the *Paine* of the *Teeth*, is one of the sharpest of *Paines*.

Concerning



Concerning *Teeth*, these Things are to be Considered. 1. The *Preserving* of them. 2. The *Keeping* of them *White*. 3. The *Drawing* of them with *Least Paine*. 4. The *Staying* and *Easing* of the *Tooth-Ach*. 5. The *Binding* in of *Artificiall Teeth*, where *Teeth* have beene stricken out. 6. And last of all, that Great One, of *Restoring Teeth* in *Age*. The *Instances* that giue any likelihood of *Restoring Teeth* in *Age*, are; The *Late Comming* of *Teeth* in some; And the *Renewing* of the *Beakes* in *Birds*, which are *Commateriall* with *Teeth*. *Quare* therefore more particularly how that commeth. And againe, the *Renewing* of *Hornes*. But yet that hath not beene knowne to have beene prouoked by *Art*; Therefore let *Triall* be made, whether *Hornes* may be procured to grow in *Beasts* that are not *Horned*, and how? And whether they may be procured to come *Larger* than vsuall; As to make an *Oxe*, or a *Deere*, haue a *Greater Head* of *Hornes*? And whether the *Head* of a *Deere*, that by *Age* is more *Spitted*, may be brought againe to be more *Branched*; For these *Trialls*, and the like, will shew, whether by *Art* such *Hard Matter* can be called, and prouoked. It may be tried also, whether *Birds* may not haue some thing done to them, when they are *Young*, whereby they may be made to haue *Greater*, or *Longer Bils*; Or *Greater* and *Longer Tallons*? And whether *Children* may not haue some *Wash*, or Something to make their *Teeth* *Better*, and *Stronger*? *Corall* is in vſe as an *Helpe* to the *Teeth* of *Children*.

**S**OME *Living Creatures* generate but at certaine *Seasons* of the *Yeere*; As *Deere*, *Sheepe*, *Wilde Conneyes*, &c. And most Sorts of *Birds*, and *Fishes*: Others at any time of the *Yeere*, as *Men*; And all *Domesticke Creatures*; As *Horses*, *Hogges*, *Dogges*, *Cats*, &c. The *Cause* of *Generation* at all *Seasons* seemeth to be *Fulnesse*: For *Generation* is from *Redundance*. This *Fulnesse* ariseth from two *Causes*; Either from the *Nature* of the *Creature*, if it be *Hot*, and *Moist*, and *Sanguine*; Or from *Plenty* of *Food*. For the first, *Men*, *Horses*, *Dogs*, &c. which breed at all *Seasons*, are full of *Heat* and *Moisture*; *Doves* are the fullest of *Heat* and *Moisture* amongst *Birds*, and therefore breed often; The *Tame Dove* almost continually. But *Deere* are a *Melancholy Dry Creature*, as appeareth by their *Fearfulnessse*, and the *Hardnesse* of their *Flesh*. *Sheepe* are a *Cold Creature*, as appeareth by their *Mildnesse*, and for that they seldome *Drinke*. Most sort of *Birds* are of a dry *Substance* in comparison of *Beasts*. *Fishes* are cold. For the second *Cause*, *Fulnesse* of *Food*; *Men*, *Kine*, *Swine*, *Dogs*, &c. feed full; And we see that those *Creatures*, which being *Wilde*, generate seldome, being *Tame*, generate often; Which is from *Warmth*, and *Fulnesse* of *Food*. We finde, that the Time of *Going to Rut* of *Deere*, is in *September*; For that they need the whole *Summers Feed* and *Grasse*, to make them fit for *Generation*. And if *Raine* come Early about the Middle of *September*, they goe to *Rut* somewhat the sooner; If *Drought*, somewhat the later. So *Sheepe*, in respect of their small *Heat*, generate about the same time, or somewhat before. But for the most part, *Creatures* that generate at cer-

Experiments  
in Consort  
touching the  
Generation and  
Bearing of Li-  
ving Creatures  
in the Wombe.



tainc Seasons, generate in the Spring; As Birds, and Fishes; For that the End of the Winter, and the Heat, and Comfort of the Spring prepareth them. There is also another Reason, why some Creatures generate at certaine Seasons: And that is the Relation of their Time of Bearing, to the time of Generation: For no Creature goeth to generate, whilst the Female is full; Nor whilst she is busie in Sitting or Rearing her Young. And therefore it is found by Experience, that if you take the Egges, or Young Ones, out of the Neests of Birds, they will fall to generate againe, three or foure times, one after another.

759

Of Living Creatures, some are Longer time in the Wombe, and some Shorter. Women goe commonly nine Moneths; The Cow and the Ewe, about six Moneths; Doe's goe about nine Moneths; Mares eleuen Moneths; Bitches nine Weekes; Elephants are said to goe two Yeeres; For the Receiued Tradition of ten Yeeres is Fabulous. For Birds there is double Enquiry; The Distance betweene the Treading or Coupling, and the Laying of the Egge; And againe betweene the Egge Layed, and the Discloding or Hatching. And amongst Birds, there is lesse Diuersity of Time than amongst other Creatures; yet some there is: for the Hen sitteth but three Weekes; The Turkey-Hen, Goose, and Ducke, a Moneth. Quere of others. The Cause of the great Difference of Times, amongst Living Creatures, is, Either from the Nature of the Kinde; Or from the Constitution of the Wombe. For the former, those that are longer in Comming to their Maturity or Growth, are longer in the Wombe; As is chiefly seene in Men; And so Elephants which are long in the Wombe, are long time in Comming to their full Growth. But in most other Kindes, the Constitution of the Wombe, (that is, the Hardnesse or Drinesse thereof,) is concurrent with the former Cause. For the Colt hath about foure yeeres of Growth; And so the Fawne; And so the Calse. But Whelps, which come to their Growth (commonly) within three Quarters of a yeere, are but nine Weekes in the Wombe. As for Birds, as there is lesse Diuersity amongst them, in the time of their Bringing forth; So there is lesse Diuersity in the time of their Growth; Most of them comming to their Growth within a Twelue-Moneth.

760

Some Creatures bring forth many Young Ones at a Burthen; As Bitches, Hares, Connyes, &c. Some (ordinarily) but One; As Women, Lionesses, &c. This may be caused either by the Quantity of Sperme required to the Producing One of that Kinde; which if lesse bee required, may admit greater Number; If more, fewer: Or by the Partitions and Cells of the Wombe, which may seuer the Sperme.

Experiments  
in Consort  
touching Species  
Visible.

761

There is no doubt, but Light by Refraction will shew greater, as well as Things Coloured. For like as a Shilling, in the Bottom of the Water, will shew greater; So will a Candle in a Lanthorne, in the Bottom of the Water. I haue heard of a Practise, that Glo-wormes in Glasses were put in the Water, to make the Fish come. But I am not yet informed, whether when a Diner Diueth, hauing his Eyes open, and swimmeth vpon his Backe;



Backe; whether (I say) he seeth *Things* in the *Aire* greater, or lesse. For it is manifest, that when the *Eye* standeth in the *Finer Medium*, and the *Object* is in the *Grosser*, things shew greater; But contrariwise, when the *Eye* is placed in the *Grosser Medium*, and the *Object* in the *Finer*, how it worketh I know not.

It would be well boulded out, whether great *Refractions* may not bee made vpon *Reflexions*, as well as vpon *Direct Beames*. For Example, We see that take an *Empty Basen*, put an *Angell* of *Gold*, or what you will, into it; Then goe so farre from the *Basen*, till you cannot see the *Angell*, because it is not in a *Right Line*; Then fill the *Basen* with *Water*, and you shall see it out of his Place, because of the *Reflection*. To proceed therefore, put a *Looking-Glasse* into a *Basen* of *Water*; I suppose you shall not see the *Image* in a *Right Line*, or at equall *Angles*, but aside. I know not, whether this *Experiment* may not be extended so, as you might see the *Image*, and not the *Glasse*; Which for *Beauty* and *Strangenesse*, were a fine Prooffe: For then you should see the *Image* like a *Spirit* in the *Aire*. As for Example, If there be a *Cesterne* or *Poole* of *Water*, you shall place ouer against it a *Picture* of the *Devill*, or what you will, so as you doe not see the *Water*. Then put a *Looking-Glasse* in the *Water*: Now if you can see the *Devils Picture* aside, not seeing the *Water*, it will looke like a *Devill* indeed. They haue an old Talc in *Oxford*, that *Friar Bacon* walked betweene two *Steeple*s: Which was thought to be done by *Glasses*, when he walked vpon the *Ground*.

762

**A** *Weighty Body* put into *Motion*, is more easily impelled, than at first when it *Resteth*. The *Cause* is, Partly because *Motion* doth discusse the *Torpor* of *Solid Bodies*; Which beside their *Motion* of *Gravity*, haue in them a *Naturall Appetite*, not to moue at all; And partly, because a *Body* that resteth, doth get, by the *Resistance* of the *Body* vpon which it resteth, a stronger *Compression* of *Parts*, than it hath of it Selse: And therefore needeth more *Force* to be put in *Motion*. For if a *Weighty Body* be *Penfile*, and hang but by a *Thred*, the *Percussion* will make an *Impulsion* very neere as easily, as if it were already in *Motion*.

Experiments  
in Consort,  
touching *Im-  
pulsion* and *Per-  
cussion*.

763

A *Body* *Ouer-great*, or *Ouer-small*, will not be throwne so farre, as a *Body* of a *Middle Size*: So that (it seemeth) there must be a *Commensuration*, or *Proportion*, betweene the *Body Moued*, and the *Force*, to make it moue well. The *Cause* is, because to the *Impulsion*, there is requisite the *Force* of the *Body* that *Moueth*, and the *Resistance* of the *Body* that is *Moued*: And if the *Body* be too great, it yeeldeth too little; And if it be too small, it resisteth too little.

764

It is *Common Experience*, that no *Weight* will presse or cut so strong, being laid vpon a *Body*, as *Falling*, or stricken from aboue. It may be the *Aire* hath some part in furthering the *Percussion*: But the chiefe *Cause* I take to be, for that the *Parts* of the *Body Moued*, haue by *Impulsion*, or by the *Motion* of *Gravity continued*, a *Compression* in them, as well downwards, as they haue when they are throwne, or Shot thorow the *Aire*,

765



Experiment  
Solitary tou-  
ching Titilla-  
tion.

766

forwards. I conceiue also, that the quicke *Loose* of that *Motion*, preuenteth the *Resistance* of the *Body* below; And *Priority* of the *Force* (alwaies) is of great *Efficacy*; As appeareth in infinite *Instances*.

**T**ickling is most in the *Soles* of the *Feet*, and vnder the *Arme-Holes*, and on the *Sides*. The *Cause* is, the *Thinness* of the *Skinne* in those *Parts*; Ioyned with the *Rarenesse* of being touched there. For all *Tickling* is a light *Motion* of the *Spirits*, which the *Thinness* of the *Skin*, and *Suddenesse*, and *Rarenesse* of *Touch*, doe further: For we see, a *Feather*, or a *Rush*, drawne along the *Lip*, or *Cheeke*, doth tickle; Whereas a *Thing* more *Obtuse*, or a *Touch* more *Hard*, doth not. And for *Suddenesse*; We see no *Man* can tickle himselfe: We see also, that the *Palme* of the *Hand*, though it hath as *Thin* a *Skin*, as the other *Parts* Mentioned, yet is not *Ticklish*, because it is accustomed to be *Touched*. *Tickling* also cauſeth *Laughter*. The *Cause* may be, the *Emission* of the *Spirits*, and so of the *Breath*, by a *Flight* from *Titillation*; For vpon *Tickling*, we see there is euer a *Starting*, or *Shrinking* away of the *Part*, to auoid it; And we see also, that if you *Tickle* the *Nostrils*, with a *Feather*, or *Straw*, it procureth *Sneezing*; Which is a *Sudden Emission* of the *Spirits*, that doe likewise expell the *Moisture*. And *Tickling* is euer *Painfull*, and not well endured.

Experiment  
Solitary tou-  
ching the Scar-  
city of Raine in  
*Egypt*.

767

**I**T is strange, that the *Riner* of *Nilus*, Ouer-flowing as it doth, the *Country* of *Egypt*, there should be neuerthelesse little or no *Raine* in that *Country*. The *Cause* must be, Either in the *Nature* of the *Water*; Or in the *Nature* of the *Aire*; Or of Both. In the *Water*, it may be ascribed, either vnto the *Long Race* of the *Water*: For *Swift Running Waters* vapour not so much as *Standing Waters*; Or else to the *Concoction* of the *Water*; For *Waters* well *Concocted* vapour not so much, as *Waters Raw*; No more than *Waters* vpon the *Fire* doe vapour so much, after some time of *Boyling*, as at the first. And it is true, that the *Water* of *Nilus* is sweeter than other *Waters* in *Taste*; And it is excellent *Good* for the *Stone*, and *Hypochondriacall Melancholy*; Which sheweth it is *Lenessing*: And it runneth thorow a *Countrie* of a *Hot Climate*, and flat, without *Shade*, either of *Woods*, or *Hills*; Whereby the *Sunne* must needs haue great *Power* to *Concoct* it. As for the *Aire*, (from whence I conceiue this *Want* of *Showers* commeth chiefly;) The *Cause* must be, for that the *Aire* is, of it selfe, *Thin* and *Thirsty*; And as soone as euer it getteth any *Moisture* from the *Water*, it imbibeth, and dissipateth it, in the whole body of the *Aire*; And suffereth it not to remaine in *Vapour*; Whereby it might breed *Raine*.

Experiment  
Solitary tou-  
ching Clarifi-  
cation.

768

**I**T hath beene touched in the *Title* of *Percolations*, (Namely such as *are Inwards*;) that the *Whites* of *Egs*, and *Milke*, doe clarify; And it is certaine, that in *Egypt*, they prepare and clarify the *Water* of *Nile*, by putting it into great *Iarres* of *Stone*, and *Stirring* it about with a few

Stamped



Stamped *Almonds*; Wherewith they also besmeare the Mouth of the *Vessel*; And so draw it off, after it hath rested some time. It were good, to trie this *Clarifying* with *Almonds*, in *New Beere*, or *Must*, to hasten, and perfect the *Clarifying*.

Here be scarce to be found any *Vegetables*, that haue *Branches*, and no *Leaves*; except you allow *Corall* for one. But there is also in the *Desarts* of *S. Macario* in *Egypt*, a *Plant* which is Long, Leauelless, Browne of Colour, and Branched like *Corall*, saue that it closeth at the *Top*. This being set in *Water* within *House*, spreadeth and displayeth strangely; And the People thereabouts haue a Superstitious Beleeve, that in the *Labour* of *Women*, it helpeth to the *Easie Deliuance*.

The *Crystalline Venice Glasse*, is reported to be a Mixture, in equall Portions, of *Stones*, brought from *Pania*, by the *River Ticinum*; And the *Ashes* of a *Weed* called by the *Arabs Kall*, which is gathered in a *Desart* betweene *Alexandria* and *Rosetta*; And is by the *Egyptians* vsed first for *Fuell*; And then they crush the *Ashes* into Lumps, like a *Stone*; And so sell them to the *Venetians* for their *Glasse-workes*.

It is strange, and well to be noted, how long *Carkasses* haue continued *Incrrupt*, and in the former *Dimensions*; As appeareth in the *Mummies* of *Egypt*; Hauing lasted, as is conceiued, (some of them,) three thousand yeeres. It is true, they finde Meanes to draw forth the *Braines*, and to take forth the *Entrailes*, which are the *Parts* aptest to corrupt. But that is nothing to the Wonder: For we see, what a Soft and Corruptible *Substance* the *Flesh*, of all the other *Parts* of the *Body*, is. But it should seeme, that according to our *Observation*, and *Axiome*, in our hundredth *Experiment*, *Putrefaction*, which we conceiue to be so *Naturall* a *Period* of *Bodies*, is but an *Accident*; And that *Matter* maketh not that *Haste* to *Corruption*, that is conceiued. And therefore *Bodies*, in *Shining-Amber*; In *Quick-Siluer*; In *Balmes*, (whereof wee now speake;) In *Wax*; In *Honey*; In *Gummes*; And (it may be) in *Conservatories* of *Snow*; &c. are preserved very long. It need not goe for Repetition, if we resume againe that which we said in the aforesaid *Experiments*, concerning *Annihilation*; Namely, that if you prouide against three *Causes* of *Putrefaction*, *Bodies* will not corrupt: The First is, that the *Aire* be excluded; For that vndermineth the *Body*, and conspireth with the *Spirit* of the *Body* to dissolue it. The Second is, that the *Body* *Adiacent* and *Ambient* be not *Commateriall*, but meerely *Heterogeneall* towards the *Body* that is to be preserved: For if Nothing can be receiued by the One, Nothing can issue from the Other; Such are *Quick-Siluer*, and *White-Amber*, to *Herbs*, and *Flies*, and such *Bodies*. The Third is, that the *Body* to be preserved, be not of that *Grosse*, that it may corrupt within it selfe, although no Part of it issue into the *Body* *Adiacent*: And therefore it must be rather *Thin*, and *Small*, than of *Bulke*. There is a Fourth *Remedie* also, which is; That

Experiment  
Solitary, touching  
*Plants*  
without *Leaves*.

769

Experiment  
Solitary touching the  
*Materials* of *Glasse*.

770

Experiment  
Solitary, touching  
*Prohibition* of *Putrefaction*,  
and the  
*Long Conservation*  
of *Bodies*.

771



That if the *Body* to be preserved be of *Bulke*, as a *Corps* is, then the *Body* that Incloseth it, must haue a Vertue to draw forth, and drie the *Moisture* of the *Inward Body*; For else the *Putrefaction* will play within, though nothing issue forth. I remember *Liuy* doth relate, that there were found, at a time, two *Coffins* of *Lead*, in a *Tombe*; Whereof the one contained the *Body* of *King Numa*; It being some foure hundred yeares after his Death: And the other, his *Bookes* of *Sacred Rites* and *Ceremonies*, and the *Discipline* of the *Pontifes*; And that in the *Coffin* that had the *Bodie*, there was Nothing (at all) to be seene, but a little light *Cinders* about the *Sides*; But in the *Coffin* that had the *Bookes*, they were found as fresh, as if they had beene but newly *Written*; being written in *Parchment*, and couered ouer with *Watch-Candles* of *Wax*, three or foure fold. By this it seemeth, that the *Romans*, in *Numa's* time, were not so good *Embalmers*, as the *Egyptians* were; Which was the *Cause* that the *Body* was vtterly consumed. But I finde in *Plutarch*, and Others, that when *Augustus Caesar* visited the *Sepulchre* of *Alexander the Great*, in *Alexandria*, he found the *Body* to keepe his *Dimension*; But withall, that, notwithstanding all the *Embalming*, (which no doubt was of the best,) the *Body* was so Tender, as *Caesar* touching but the *Nose* of it, defaced it. Which maketh mee finde it very strange, that the *Egyptian Mummies* should be reported to be as *Hard as Stone-Pitch*: For I finde no difference but one; Which indeed may be very *Materiall*; Namely, that the *Ancient Egyptian Mummies*, were throwed in a Number of Folds of *Linnen*, besmeared with *Gummes*, in manner of *Seare-Cloth*; Which it doth not appeare was practised vpon the *Body* of *Alexander*.

Experiment  
Solitary tou-  
ching the A-  
bundance of Ni-  
tre in certaine  
Sea-Shoars.

772

Experiment  
Solitary tou-  
ching Bodies  
that are borne  
vp by Water.

773

Experiment  
Solitary tou-  
ching Fuell,  
that consumeth  
little, or nothing.

774

**N**Eare the *Castle* of *Casie*, and by the *Wells* of *Affan*, in the *Land* of *Idumea*, a great Part of the *Way*, you would thinke the *Sea* were neare hand, though it be a good distance off: And it is Nothing, but the *Shining* of the *Nitre*, vpon the *Sea-Sands*; Such *Abundance* of *Nitre* the *Shores* there doe put forth.

**T**He *Dead-Sea*, which vomiterh vp *Bitumen*, is of that *Crafftitude*, as *Living Bodies* bound Hand and Foot, cast into it, haue beene borne vp, and not sunke. Which sheweth, that all *Sinking* into *Water*, is but an *Over-Weight* of the *Body*, put into the *Water*, in respect of the *Water*: So that you may make *Water* so strong, and heavy, of *Quick-Siluer*, (perhaps,) or the like, as may beare vp *Iron*: Of which I see no *Vse*, but *Imposture*. We see also, that all *Metalls*, except *Gold*, for the same reason, swimme vpon *Quick-Siluer*.

**I**T is reported, that at the *Foot* of a *Hill*, neare the *Mare mortuum*, there is a *Blacke Stone*, (whereof *Pilgrims* make *Fires*,) which burneth like a *Coale*, and diminisheth not; But onely waxeth Brighter, and Whiter. That it should doe so, is not strange; For we see *Iron Red Hot* burneth, and consumeth not: But the *Strangenesse* is, that it should continue any time



time so: For *Iron*, as soone as it is out of the Fire, deadeth straightwaies. Certainly, it were a Thing of great Use, and Profit, if you could finde out *Fuell*, that would burne Hot, and yet last long: Neither am I altogether Incredulous, but there may be such *Candles*, as they say are made of *Salamanders Wooll*: Being a Kinde of *Minerall*, which whiteneth also in the Burning, and consumeth not. The Question is this; *Flame* must be made of somewhat; And commonly it is made of some *Tangible Body*, which hath *Weight*: But it is not impossible, perhaps, that it should be made of *Spirit* or *Vapour*, in a *Body*; (which *Spirit* or *Vapour* hath no *Weight*;) such as is the Matter of *Ignis Fatuus*. But then you will say, that that *Vapour* also can last but a short time: To that it may be answered, That by the helpe of *Oile* and *Wax*, and other *Candle-Stuffe*, the *Flame* may continue, and the *Wicke* not burne.

**S**ea-Coale last longer than *Char-Coale*; And *Char-Coale* of *Roots*, being scoaled into great Peeces, last longer than Ordinary *Char-Coale*. *Turfe*, and *Peat*, and *Cow-Sheards*, are cheape *Fuels*, and last long. *Small-Coale*, or *Briar-Coale*, powred vpon *Char-Coale*, make them last longer. *Sedge* is a cheape *Fuell* to Brew, or Bake with; the rather because it is good for Nothing else. Triall would be made of some Mixture of *Sea-Coale* with *Earth*, or *Chalke*; For if that *Mixture* be, as the *Sea-Coale-Men* vse it, priuily, to make the Bulke of the *Coale* greater, it is Deceit; But if it be vsed purposely, and be made knowne, it is Sauing.

**I**T is, at this Day, in vse, in *Gaza*, to couch *Pot-Sheards* or *Vessels* of *Earth*, in their *Walls*, to gather the *Wind* from the Top, and to passe it downe in *Spouts* into *Roomes*. It is a Deuice for *Freshnesse*, in great Heats: And it is said, there are some *Roomes* in *Italy*, and *Spaine*, for *Freshnesse*, and *Gathering* the *Winds*, and *Aire*, in the Heats of *Summer*. But they be but *Pennings* of the *Winds*, and *Enlarging* them againe, and *Making* them *Reuerberate*, and goe round in *Circles*, rather than this *Deuice* of *Spouts* in the *Wall*.

**T**Here would be vsed much diligence, in the Choice of some *Bodies*, and *Places*, (as it were) for the *Tasting* of *Aire*; to discover the *Wholesomenesse* or *Vnwholesomenesse*, as well of *Seasons*, as of the *Seats* of *Dwellings*. It is certaine, that there be some *Houses*, wherein *Confitures*, and *Pies*, will gather *Mould*, more than in Others. And I am perswaded, that a *Peece* of *Raw Flesh*, or *Fish*, will sooner corrupt in some *Aires*, than in Others. They be noble *Experiments*, that can make this *Discovery*; For they serue for a *Naturall Diuination* of *Seasons*; Better than the *Astronomers* can by their *Figures*: And againe, they teach *Men* where to chuse their *Dwelling*, for their better *Health*.

**T**Here is a Kinde of *Stone*, about *Bethleem*, which they grinde to *Powder*, and put into *Water*, whereof *Cattell* drinke; which maketh them

giue

Experiment  
Solitary, Occo-  
nomicall touch-  
ing Cheape  
Fuell.

775

Experiment  
Solitary, touch-  
ing the Ga-  
thering of *Wind*  
for *Freshnesse*.

776

Experiment  
Solitary touch-  
ing the Tri-  
alls of *Aires*.

777

Experiment  
Solitary touch-  
ing Increa-



Expt of Milke in  
Milk Beasts.

778

Experiment  
Solitary tou-  
ching Sand of  
the Nature of  
Glasfe.

779

Experiment  
Solitary tou-  
ching the  
Growth of Co-  
rall.

780

Experiment  
Solitary, tou-  
ching the Ga-  
thering of  
Manna.

781

Experiment  
Solitary tou-  
ching the Cor-  
recting of Wine.

782

giue more *Milke*. Surely, there would be some better Trialls made of *Mixtures of Water in Ponds for Cattell*, to make them more *Milch*; Or to *Fatten* them; Or to *Keepe* them from *Murraine*. It may be, *Chalke*, and *Nitre*, are of the best.

IT is reported, that in the *Valley*, neere the *Mountaine Carmel*, in *Iudea*, there is a *Sand*, which of all other, hath most Affinity with *Glasfe*; In-  
somuch as other *Minerals*, laid in it, turne to a *Glassie Substance*, with-  
out the *Fire*; And againe *Glasfe* put into it, turneth into the *Mother-Sand*.  
The thing is very strange, if it be true: And it is likeliest to be Caused by  
some *Naturall Fornace*, or *Heat* in the *Earth*: And yet they doe not speak  
of any *Eruption of Flames*. It were good to try in *Glasfe-Workes*, whe-  
ther the *Crude Materials of Glasfe*, mingled with *Glasfe*, already made, and  
Re-moulten, doe not facilitate the *Making of Glasfe* with lesse *Heat*.

IN the *Sea*, vpon the *South-West* of *Sicily*, much *Corall* is found. It is a  
*Sub-Marine Plant*. It hath no *Leaves*: It brancheth only when it is vn-  
der *Water*; It is *Soft*, and *Greene of Colour*; But being brought into the  
*Aire*, it becommeth *Hard*, and *Shining Red*, as we see. It is said also,  
to haue a *White Berry*; But we finde it not brought ouer with the *Corall*.  
Belike it is cast away as nothing worth: Inquire better of it, for the *Dis-  
covery of the Nature of the Plant*.

THE *Manna of Calabria* is the best, and in most Plenty. They gather  
it from the *Leafe of the Mulberry Tree*; But not of such *Mulberrie  
Trees*, as grow in the *Valley's*. And *Manna* falleth vpon the *Leaves* by  
*Night*, as other *Dewes* do. It should seeme, that before those *Dews* come  
vpon *Trees* in the *Valley's*, they dissipate, and cannot hold out. It should  
seeme also, the *Mulberry-Leafe*, it selfe, hath some Coagulating Vertue,  
which inspissateth the *Dew*, for that it is not found vpon other *Trees*:  
And we see by the *Silke-Worme*, which feedeth vpon that *Leafe*, what a  
Dainty Smooth *Iuyce* it hath; And the *Leaves* also, (especially of the  
Blacke *Mulberry*,) are somewhat Bristly, which may helpe to preserue  
the *Dew*. Certainly, it were not amisse, to obserue a little better, the *Dews*  
that fall vpon *Trees*, or *Herbs*, Growing on *Mountaines*; For, it may be,  
many *Dewes* fall, that spend before they come to the *Valleyes*. And I sup-  
pose, that he that would gather the best *May-Dew* for *Medicine*, should  
gather it from the *Hills*.

IT is said, they haue a manner, to prepare their *Greeke-Wines*, to keepe  
them from *Fuming*, and *Inebriating*, by adding some *Sulphur*, or *Allome*:  
Whereof the one is *Vnctuous*, and the other is *Astringent*. And certaine  
it is, that those two *Natures* doe best repress *Fumes*. This *Experiment*  
would be transferred, vnto other *Wine*, and *Strong Beere*, by Putting in  
some like *Substances*, while they worke; Which may make them both  
to *Fume* lesse, and to *Inflame* lesse.

It



**I**T is conceiued by some, (not improbably,) that the reason, why *Wilde-Fires*, (whereof the principall Ingredient is *Bitumen*,) doe not quench with *Water*, is, for that the first *Concretion* of *Bitumen* is a *Mixture* of a *Fiery*, and *Watry Substance*: So is not *Sulphur*. This appeareth, for that in the *Place* neare *Puteoli*, which they call the *Court of Vulcan*, you shall heare, vnder the *Earth*, a Horrible Thundring of *Fire*, and *Water*, conflicting together: And there breake forth also *Spouts* of *Boyling Water*. Now that *Place* yeeldeth great *Quantities* of *Bitumen*; Whereas *Aetna*, and *Vesuius*, and the like, which consist vpon *Sulphur*, shoot forth *Smoake*, and *Ashes*, and *Pumice*, but no *Water*. It is reported also, that *Bitumen* Mingled with *Lime*, and Put vnder *Water*, will make, as it were, an *Artificiall Rocke*; The *Substance* becommeth so Hard.

Experiment  
Solitary touching the  
Materials of *Wilde-Fires*.

783

**T**Here is a *Cement*, compounded of *Floure*, *Whites* of *Egges*, and *Stone* powdered, that becommeth Hard as *Marble*; wherewith *Piscina mirabilis*, neare *Cuma*, is said to haue the *Walls* Plastered. And it is certaine, and tried, that the *Powder* of *Load-Stone*, and *Flint*, by the Addition of *Whites* of *Egges*, and *Gum-Dragon*, made into *Paste*, will in a few dayes harden to the Hardnesse of a *Stone*.

Experiment  
Solitary touching *Plaster*  
growing as  
Hard as *Marble*.

784

**I**T hath beene noted by the *Ancients*, that in *Full* or *Impure Bodies*, *Vlcers* or *Hurts* in the *Legs*, are Hard to Cure; And in the *Head* more Easie. The *Cause* is, for that *Vlcers* or *Hurts* in the *Legs* require *Deficcation*, which by the *Defluxion* of *Humours* to the *Lower Parts* is hindred; Whereas *Hurts* and *Vlcers* in the *Head* require it not; But contrariwise *Drinesse* maketh them more apt to Consolidate. And in Moderne Obseruation, the like difference hath been found, betweene *French-Men*, and *Englisb-Men*; Whereof the ones *Constitution* is more *Drie*, and the others more *Moist*. And therefore a *Hurt* of the *Head* is harder to cure in a *French-Man*, and of the *Legge* in an *Englisb-Man*.

Experiment  
Solitary touching Iudgement of the  
Cure in some  
*Vlcers* and  
*Hurts*.

785

**I**T hath beene noted by the *Ancients*, that *Southerne Winds*, blowing much, without *Raine*, doe cause a *Fenourous Disposition* of the *Yeare*; But with *Raine*, not. The *Cause* is, for that *Southerne Winds* doe, of themselves, qualifie the *Aire*, to be apt to cause *Feuers*; But when *Showers* are ioyned, they doe Refrigerate in Part, and Checke the Sultry *Heat* of the *Southerne Wind*. Therefore this holdeth not in the *Sea-Coasts*, because the *Vapour* of the *Sea*, without *Showers*, doth refresh.

Experiment  
Solitary touching the  
Healthfulnesse  
or Vnhealthfulnesse of the  
*Southerne Wind*.

786

**I**T hath beene noted by the *Ancients*, that *Wounds* which are made with *Brasse*, heale more easily, than *Wounds* made with *Iron*. The *Cause* is, for that *Brasse* hath, in it selfe, a *Sanatine Vertue*; And so in the very Instant helpeth somewhat: But *Iron* is *Corrosiue*, and not *Sanatine*. And therefore it were good, that the Instruments which are vsed by *Chirurgians* about wounds, were rather of *Brasse*, than *Iron*.

Experiment  
Solitary touching *Wounds*.

787

In



Experiment  
Solitary, tou-  
ching Mortifi-  
cation by Cold.

788

**I**N the *Cold Countries*, when Mens *Noses* and *Eares* are Mortified, and (as it were) Gangrened with *Cold*, if they come to a *Fire*, they rot off presently. The *Cause* is, for that the few *Spirits*, that remaine in those *Parts*, are suddenly drawne forth, and so *Putrefaction* is made Compleat. But *Snow* Put vpon them, helpeth; For that it preserveth those *Spirits* that remaine, till they can revieve; And besides, *Snow* hath in it a Secret *Warmth*: As the *Monke* proued out of the *Text*; *Qui dat Ninem sicut Lanam, Gelu sicut Cineres spargit*. Whereby he did inferre, that *Snow* did warme like *Wooll*, and *Frost* did fret like *Asbes*. *Warne Water* also doth good; Because by little and little it openeth the *Pores*, without any sudden Working vpon the *Spirits*. This *Experiment* may be transferred vnto the *Cure* of *Gangrenes*, either Comming of themselves, or induced by too much Applying of *Opiates*: Wherein you must beware of *Drie Heat*, and resort to Things that are *Refrigerant*, with an Inward *Warmth*, and *Vertue* of Cherishing.

Experiment  
Solitary tou-  
ching Weight.

789

**W**Eigh *Iron*, and *Aqua Fortis*, seuerally; Then dissolve the *Iron* in the *Aqua Fortis*: And weigh the *Dissolution*; And you shall finde it to beare as good *Weight*, as the *Bodies* did seuerally: Notwithstanding a good deale of *Waste*, by a thicke *Vapour*, that issueth during the *Working*: Which sheweth, that the *Opening* of a *Body*, doth increase the *Weight*. This was tried once, or twice, but I know not, whether there were any *Error*, in the *Triall*.

Experiment  
Solitary tou-  
ching the Su-  
per-Nation of  
Bodies.

790

**T**Ake of *Aqua-Fortis* two Ounces, of *Quick-silver* two Drachmes; (For that Charge the *Aqua-Fortis* will beare;) The *Dissolution* will not beare a *Flint*, as big as a *Nutmeg*: Yet (no doubt) the Increasing of the *Weight* of *Water*, will increase his *Power* of *Bearing*; As wee see *Broine*, when it is Salt enough, will beare an *Edge*. And I remember well a *Physitian*, that vsed to giue some *Minerall Baths* for the *Gout*, &c. And the *Body* when it was put into the Bath, could not get downe so easily, as in *Ordinary Water*. But it seemeth, the *Weight* of the *Quick-silver*, more than the *Weight* of a *Stone*; doth not compensate the *Weights* of a *Stone*, more than the *Weight* of the *Aqua-Fortis*.

Experiment  
Solitary tou-  
ching the Fly-  
ing of Vnquall  
Bodies in the  
Aire.

791

**L**Et there be a *Body* of *Vnequall Weight*; (As of *Wood* and *Lead*, or *Bone* and *Lead*;) If you throw it from you with the *Light-End* forward, it will turne, and the *Weightier End* will recouer to be *Forwards*; Vnlesse the *Body* be *Ouer-long*. The *Cause* is, for that the more *Dense Body*, hath a more *Violent Pressure* of the *Parts*, from the first *Impulsion*; Which is the *Cause*, (though heretofore not found out, as hath beene often said,) of all *Violent Motions*: And when the *Hinder Part* moueth swifter, (for that it lesse endureth *Pressure* of *Parts*;) than the *Forward Part* can make way for it, it must needs be, that the *Body* turne ouer: For (turned) it can more easily draw forward the *Lighter Part*. *Galilaus* noteth it well; That if an *Open Trough*, wherein *Water* is, be driuen faster than the *Water*

can



can follow, the *Water* gathereth vpon an heap, towards the *Hinder End*, where the *Motion* began; Which he supposeth, (holding confidently the *Motion* of the *Earth*,) to be the *Cause* of the *Ebbing* and *Flowing* of the *Ocean*; Because the *Earth* ouer-runneeth the *Water*. Which *Theory*, though it be false, yet the first *Experiment* is true. As for the *Inequality* of the *Pressure* of *Parts*, it appeareth manifestly in this; That if you take a *Body* of *Stone*, or *Iron*, and another of *Wood*, of the same *Magnitude*, and *Shape*, and throw them with equall *Force*, you cannot possibly throw the *Wood*, so farre, as the *Stone*, or *Iron*.

IT is certaine, (as it hath beene formerly, in part, touched,) that *Water* may be the *Medium* of *Sounds*. If you dash a *Stone* against a *Stone* in the *Bottome* of the *Water*, it maketh a *Sound*. So a long *Pole* struck vpon *Gravell*, in the *Bottome* of the *Water*, maketh a *Sound*. Nay, if you should thinke that the *Sound* commeth vby the *Pole*, and not by the *Water*, you shall finde that an *Anchor*, let downe by a *Roape*, maketh a *Sound*; And yet the *Roape* is no *Solid Body*, whereby the *Sound* can ascend.

ALL *Obiects* of the *Senses*, which are very *Offensive*, do cause the *Spirits* to retire; And vpon their *Flight*, the *Parts* are (in some degree) destitute; And so there is induced in them a *Trepidation* and *Horror*. For *Sounds*, we see that the *Grating* of a *Saw*, or any very *Harsh Noise*, will set the *Teeth* on edge, and make all the *Body* shiuer. For *Tastes*, we see that in the *Taking* of a *Potion*, or *Pils*, the *Head*, and the *Necke* shake. For *Odious Smells*, the like Effect followeth, which is lesse perceiued, because there is a *Remedy* at hand, by *Stopping* of the *Nose*: But in *Horses*, that can vse no such *Help*, we see the *Smell* of a *Carrion*, especially of a *Dead Horse*, maketh them fly away, and take on, almost as if they were *Mad*. For *Feeling*, if you come out of the *Sunne*, suddenly, into a *Shade*, there followeth a *Chilnesse* or *Shiuering* in all the *Body*. And euen in *Sight*, which hath (in effect) no *Odious Obiect*, Comming into *Sudden Darknesse*, induceth an *Offer* to *Shiuer*.

THere is, in the *City* of *Ticinum*, in *Italy*, a *Church*, that hath *Windows* onely from aboue: It is in *Length* an *Hundred Feet*, in *Breadth* *Twenty Feet*, and in *Height* neere *Fifty*; Hauing a *Doore* in the *Middest*. It reporteth the *Voice*, twelue or thirteene times, if you stand by the *Close End-Wall*, ouer against the *Doore*. The *Eccho* fadeth and dyeth by little and little, as the *Eccho* at *Pont-charenton* doth. And the *Voice* foundeth, as if it came from aboue the *Doore*. And if you stand at the *Lower End*, or on either *Side* of the *Doore*, the *Eccho* holdeth; But if you stand in the *Doore*, or in the *Middest* iust ouer against the *Doore*, not. Note that all *Eccho's* sound better against *Old walls*, than *New*; Because they are more *Dry*, and *Hollow*.

Experiment  
Solitary touching  
*Water*,  
that it may bee  
the *Medium* of  
*Sounds*.

792

Experiment  
Solitary of the  
*Flight* of the  
*Spirits* vpon  
*Odious Obiects*.

793

Experiment  
Solitary touching  
the *Super-Reflexion* of  
*Eccho's*.

794



Experiment  
Solitary tou-  
ching the Force  
of Imagination,  
Imitating that  
of the Sense.

795

**T**Hose Effects, which are wrought by the *Percussion* of the *Sense*, and by *Things in Faët*, are produced likewise, in some degree, by the *Imagination*. Therefore if a Man see another eat *Sowre* or *Acide Things*, which set the *Teeth* on edge, this *Object* tainteth the *Imagination*. So that he that seeth the *Thing* done by another, hath his owne *Teeth* also set on edge. So if a Man see another turne swiftly, and long; Or if he looke vpon *Wheels* that turne, Himselfe waxeth *Turne-sicke*. So if a Man bee vpon an *High Place*, without *Railes*, or good Hold, except he be vsed to it, he is Ready to Fall: For *Imagining* a *Fall*, it putteth his *Spirits* into the very *Action* of a *Fall*. So Many vpon the *Seeing* of others *Bleed*, or *Strangled*, or *Tortured*, Themselues are ready to faint, as if they *Bled*, or were in *Strife*.

Experiment  
Solitary tou-  
ching Preser-  
uation of Bodies.

796

**T**AKE a *Stock-Gilly-Flower*, and tie it gently vpon a *Sticke*, and put them both into a *Stoope-Glasse*, full of *Quick-siluer*, so that the *Flower* be couered: Then lay a little *Weight* vpon the Top of the *Glasse*, that may keepe the *Sticke* downe; And look vpon them after foure or fiue daies; And you shall finde the *Flower* Fresh, and the *Stalke* Harder, and lesse *Flexible*, than it was. If you compare it with another *Flower*, gathered at the same time, it will be the more manifest. This sheweth, that *Bodies* doe preserue excellently in *Quick-siluer*; And not preserue only, but, by the *Coldnesse* of the *Quick-siluer*, *Indurate*; For the *Freshnesse* of the *Flower* may be meere *Conservation*; (which is the more to be obserued, because the *Quick-siluer* presseth the *Flower*;) But the *Stiffenesse* of the *Stalke* cannot be without *Induration*, from the Cold (as it seemeth,) of the *Quick-siluer*.

Experiment  
Solitary, tou-  
ching the  
Growth, or  
Multiplying of  
Metals.

797

**I**T is reported by some of the *Ancients*, that in *Cyprus*, there is a *Kinde* of *Iron*, that being cut into *Little Peeces*, and put into the *Ground*, if it be well *Watred*, will increase into *Greater Peeces*. This is certaine, and knowne of Old; That *Lead* will multiply, and Increase; As hath beene seene in *Old Statua's* of *Stone*, which haue beene put in *Cellars*; The *Feet* of them being bound with *Leaden Bands*; Where (after a time) there appeared, that the *Lead* did swell; Insomuch as it hanged vpon the *Stone* like *Warts*.

Experiment  
Solitary, tou-  
ching the  
Drowning of  
the more Base  
Metall in the  
more Precious.

798

**I** Call *Drowning* of *Metals*, when that the *Baser Metall*, is so incorpo- rate with the more *Rich*, as it can by no Meanes be separated againe: which is a kinde of *Version*, though False: As if *Siluer* should be insepa- rably incorporated with *Gold*; Or *Copper*, and *Lead*, with *Siluer*. The An- cient *Electrum* had in it a Fifth of *Siluer* to the *Gold*; And made a *Com- pound Metall*, as fit for most vses, as *Gold*; And more Resplendent, and more Qualified in some other Properties; But then that was easily Se- parated. This to doe priuily, or to make the *Compound* passe for the *Rich Metall* Simple, is an *Adulteration*, or *Counterfeiting*: But if it bee done Auowedly, and without Disguizing, it may be a great *Sauing* of the



the *Richer Metall*. I remember to have heard of a Man, skillfull in *Metals*, that a Fifteenth Part of *Silver*, incorporate with *Gold*, will not be Recovered by any *Water of Separation*; Except you put a Greater Quantity of *Silver*, to draw to it the Lesse; which (he said) is the last Refuge in *Separations*. But that is a tedious way, which no Man (almost) will thinke on. This would be better enquired; And the Quantity of the Fifteenth turned to a Twentieth; And likewise with some little Additionall, that may further the *Intrinsique Incorporation*. Note that *Silver* in *Gold* will be detected by *Weight*, compared with the *Dimension*; But *Lead* in *Silver*, (*Lead* being the *Weightier Metall*;) will not be detected; If you take so much the more *Silver*, as will counteruaile the *Over-Weight* of the *Lead*.

**G**old is the only *Substance*, which hath nothing in it *Volatile*, and yet melteth without much difficulty. The *Melting* sheweth that it is not *Ieiune*, or *Scarce in Spirit*. So that the *Fixing* of it, is not *Want of Spirit* to fly out, but the *Equall Spreading* of the *Tangible Parts*, and the *Close Concernation* of them: Whereby they have the lesse Appetite, and no meanes (at all) to issue forth. It were good therefore to try, whether *Glasse Re-Moulten* doe leese any *Weight*? For the *Parts* in *Glasse* are evenly Spred; But they are not so Close as in *Gold*; As wee see by the Easie Admission of *Light*, *Heat*, and *Cold*; And by the *Smalnesse* of the *Weight*. There be other *Bodies*, *Fixed*, which have little or no *Spirit*: So as there is nothing to fly out; As we see in the *Stuffe*, whereof *Copples* are made; Which they put into *Furnaces*; Vpon which *Fire* worketh not: So that there are three *Causes of Fixation*; The Euen *Spreading* both of the *Spirits*, and *Tangible Parts*; The *Closenesse* of the *Tangible Parts*; And the *Ieiunenesse* or *Extreme Comminution* of *Spirits*: Of which Three, the Two First may be ioyned with a *Nature Liquefiable*; The Last not.

**I**T is a *Profound Contemplation* in *Nature*, to consider of the *Emptiness* (as we may call it) or *Insatisfaction* of severall *Bodies*; And of their *Appetite* to take in Others. *Aire* taketh in *Lights*, and *Sounds*, and *Smells*, and *Vapours*; And it is most manifest, that it doth it, with a kinde of *Thirst*, as not satisfied with his owne former *Consistencie*; For else it would neuer receiue them in so suddenly, and easily. *Water* and all *Liquours*, doe hastily receiue *Dry* and more *Terrestriall Bodies*, Proportionable: And *Dry Bodies*, on the other side, drinke in *Waters*, and *Liquors*: So that, (as it was well said, by one of the *Ancients*, of *Earthy* and *Watry Substances*;) *One is a Glue to another*. *Parchments*, *Skins*, *Cloth*, &c. drinke in *Liquors*, though themselves be *Entire Bodies*, and not *Comminuted*, as *Sand*, and *Asbes*; Nor apparantly *Porous*: *Metals* themselves doe receiue in readily *Strong-Waters*; And *Strong-Waters* likewise doe readily pierce into *Metals*, and *Stones*: And that *Strong-Water* will touch vpon *Gold*, that will not touch vpon *Silver*; And *e conuerso*. And *Gold*, which

Experiment  
Solitary touching  
Fixation  
of Bodies.

799

Experiment  
Solitary touching the  
Reflexe Nature of  
Things in  
Themselves, and  
their Desire to  
change.

800

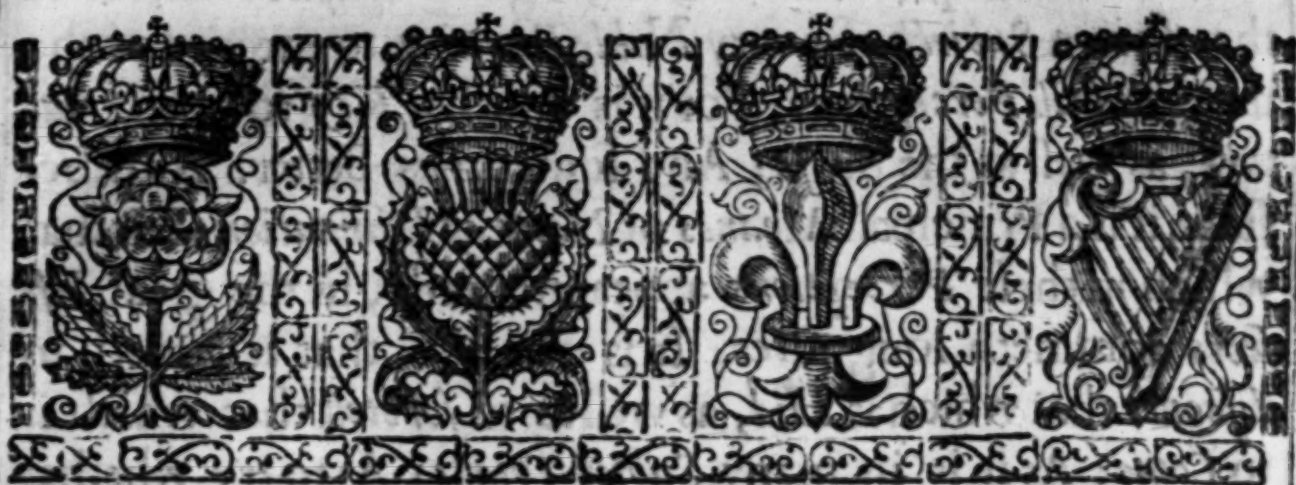


which seemeth by the *Weights* to be the Closest, and most Solid Body, doth greedily drinke in *Quick-silver*. And it seemeth, that this Reception of other Bodies, is not Violent: For it is (many times) Reciprocall, and as it were with Consent. Of the Cause of this, and to what *Axiome* it may be referred, consider attentively; For as for the Pretty Assertion; that *Matter* is like a *Common Strumpet*, that desireth all *Partner*, it is but a *Wandering Nation*. Onely *Flame* doth not content it selfe to take in any other Body; But either, to overcome and turne another Body into it Selfe, as by Victory; Or it Selfe to dye, and goe out.

## V. NATV.

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# NATVRALL HISTORIE.

## IX. Century.



It is certaine, that all *Bodies* whatsoeuer, though they haue no *Sense*, yet they haue *Perception*: For when one *Body* is applied to another, there is a Kinde of *Election*, to embrace that which is Agreeable, and to exclude or expell that which is Ingrate: And whether the *Body* be *Alterant*, or *Altered*, euermore a *Perception* precedeth *Operation*: For else all *Bodies* would be alike One to Another. And sometimes this *Perception* in some Kinde of *Bodies*, is farre more Subtill than the *Sense*; So that the *Sense* is but a dull Thing in Comparison of it: Wee see a *Weather-Glasse*, will finde the least difference of the *Weather*, in *Heat*, or *Cold*, when Men finde it not. And this *Perception* also, is sometimes at *Distance*, as well as vpon the *Touch*; As when the *Load-Stone* draweth *Iron*; or

Experiments  
in Consort,  
touching Per-  
ception in *Bodies*  
*Insensible*, ten-  
ding to *Natural*  
*Dimination*, or  
*Subtill Trials*.



*Flame* fireth *Naphtha* of *Babylon*, a great distance off. It is therefore a *Subiect* of a very *Noble Enquiry*, to enquire of the more *Subtill Perceptions*; For it is another *Key* to open *Nature*, as well as the *Sense*; And sometimes *Better*. And besides, it is a *Principall Meanes* of *Naturall Diuination*; For that which in these *Perceptions* appeareth early, in the great *Effects* commeth long after. It is true also, that it serueth to *discover* that which is *Hid*, as well as to *foretell* that which is to *Come*; As it is in many *Subtill Trialls*; As to try whether *Seeds* be old, or new, the *Sense* cannot informe: But if you boile them in *Water*, the *New Seeds* will sprout sooner: And so of *Water*, the *Taste* will not discover the best *Water*; But the *Speedy Consuming* of it, and many other *Meanes*, which we haue heretofore set downe, will discover it. So in all *Physiognomy*, the *Lineaments* of the *Body* will discover those *Naturall Inclinations* of the *Minde*, which *Disimulation* will conceale, or *Discipline* will suppress. We shall therefore now handle only, those two *Perceptions*, which pertaine to *Naturall Diuination*, and *Discovery*: Leauing the Handling of *Perception* in other Things, to be disposed Elsewhere. Now it is true, that *Diuination* is attained by other *Meanes*; As if you know the *Causes*; If you know the *Concomitants*; you may iudge of the *Effect* to follow: And the like may bee said of *Discovery*; But we tie our Selues here, to that *Diuination* and *Discovery* chiefly, which is Caused by an *Early*, or *Subtill Perception*.

The *Aptnesse* or *Propension* of *Aire*, or *Water*, to *Corrupt* or *Putrifie*, (no doubt,) is to be found before it breake forth into manifest *Effects* of *Diseases*, *Blastings*, or the like. Wee will therefore set downe some *Prognosticks* of *Pestilentiall* and *Unwholsome Yeeres*.

801

The *Wind* blowing much from the *South*, without *Raine*; And *Wormes* in the *Oake-Apple*; haue beene spoken of before. Also the *Plenty* of *Frogs*, *Grashoppers*, *Flies*, and the like *Creatures* bred of *Putrefaction*, doth portend *Pestilentiall Yeeres*.

802

*Great*, and *Early Heats* in the *Spring*, (and namely in *May*,) without *Winds*, portend the same; And generally so doe *Yeeres* with little *Wind*, or *Thunder*.

Great



*Great Droughts* in *Summer*, lasting till towards the *End* of *August*, and some *Gentle Showers* vpon them; And then some *Drie Weather* againe; Doe portend a *Pestilent Summer*, the *Yeare* following: For about the *End* of *August*, all the *Sweetnesse* of the *Earth*, which goeth into *Plants*, and *Trees*, is exhaled; (And much more if the *August* be drie;) So that nothing then can breathe forth of the *Earth*, but a grosse *Vapour*, which is apt to *Corrupt* the *Aire*: And that *Vapour*, by the first *Showers*, if they be *Gentle*, is released, and commeth forth abundantly. Therefore they that come abroad soone after those *Showers*, are commonly taken with *Sicknesse*: And in *Affricke*, no Bodie will stirre out of doores, after the first *Showers*. But if the *Showers* come vehemently, then they rather wash and fill the *Earth*, than giue it leaue to breathe forth presently. But if *Drie Weather* come againe, then it fixeth and continueth the *Corruption* of the *Aire*, vpon the first *Showers* begun; And maketh it of ill *Influence*, euen to the Next *Summer*; Except a very *Frosty Winter* discharge it; Which seldome succeedeth such *Drought*.

803

The *Lesser Infections*, of the *Small Pockes*, *Purple Feuers*, *Agues*, in the *Summer* *Precedent*, and houering all *Winter*, doe portend a great *Pestilence* in the *Summer* following; For *Putrefaction* doth not rise to his height at once.

804

It were good to lay a *Peece* of *Raw Flesh*, or *Fish*, in the *Open Aire*; And if it *Putrefie* quickly, it is a *Signe* of a *Disposition* in the *Aire* to *Putrefaction*. And because you cannot be informed, whether the *Putrefaction* be quicke or late, except you compare this *Experiment* with the like *Experiment* in another *Yeare*, it were not amisse, in the same *Yeare*, and at the same *Time*, to lay one *Peece* of *Flesh*, or *Fish*, in the *Open Aire*, and another of the same *Kinde* and *Bignesse*, within *Doores*: For I iudge, that if a generall *Disposition* be in the *Aire* to *Putrefie*, the *Flesh*, or *Fish*, will sooner *Putrefie* abroad, where the *Aire* hath more power, than in the *House*, where it hath lesse, being many wayes corrected. And this *Experiment* would be made about the *End* of *March*: For that *Season* is likest to discouer, what the *Winter* hath done; And what the *Summer* following will doe vpon the *Aire*. And because the *Aire* (no doubt) receiueth great *Tincture*, and *Infusion* from the *Earth*; It were good to trie that *Exposing* of *Flesh*, or *Fish*, both vpon a *Stake* of *Wood*, some height aboue the *Earth*, and vpon the *Flat* of the *Earth*.

805

Take *May-Dew*, and see whether it *putrefie* quickly, or no? For that likewise may disclose the *Qualitie* of the *Aire*, and *Vapour* of the *Earth*, more or lesse *Corrupted*.

806

A *Drie March*, and a *Drie May*, portend a *Wholesome Summer*, if there be a *Showring Aprill* betweene: But otherwise, it is a *Signe* of a *Pestilentiall Yeare*.

807

As the *Discovery* of the *Disposition* of the *Aire*, is good for the *Prognostickes* of *Wholesome*, and *Unwholesome Yeares*; So it is of much more vse, for the *Choice* of *Places* to dwell in: At the least, for *Lodges*, and *Retiring Places* for *Health*; (For *Mansion Houses* respect *Promissions*, as well

808

as



as *Health*; Wherein the *Experiments* aboue mentioned may serue.

809

But for the *Choice* of *Places*, or *Seats*, it is good to make *Triall*, not onely of *Aptnesse* of *Aire* to corrupt, but also of the *Moisture* and *Drinesse* of the *Aire*; and the *Temper* of it, in *Heat*, or *Cold*; For that may concerne *Health* diuersly. We see that there be some *Houses*, wherein *Sweet Meats* will relent, and *Baked Meats* will mould, more than in others; And *Wainscots* will also sweat more; so that they will almost run with *Water*: All which, (no doubt,) are caused chiefly by the *Moistnesse* of the *Aire*, in those *Seats*. But because it is better to know it, before a *Man* buildeth his *House*, than to finde it after, take the *Experiments* following.

810

Lay *Wooll*, or a *Sponge*, or *Bread*, in the *Place* you would try, comparing it with some other *Places*; And see whether it doth not moisten, and make the *Wooll*, or *Sponge*, &c. more *Ponderous*, than the other? And if it doe, you may iudge of that *Place*, as *Situate* in a *Grosse*, and *Moist Aire*.

811

Because it is certaine, that in some *Places*, either by the *Nature* of the *Earth*, or by the *Situation* of *Woods*, and *Hills*, the *Aire* is more *Vnequall*, than in Others; And *Inequality* of *Aire* is euer an *Enemy* to *Health*; It were good to take two *Weather-Glasses*, *Matches* in all things, and to set them for the same *Houres* of One day, in seuerall *Places* where no *Shade* is, nor *Enclosures*: And to marke when you set them, how farre the *Water* commeth; And to compare them, when you come againe, how the *Water* standeth then: And if you finde them *Vnequall*, you may be sure that the *Place* where the *Water* is lowest, is in the *Warmer Aire*, and the other in the *Colder*. And the greater the *Inequality* bee, of the *Ascent*, or *Descend* of the *Water*, the greater is the *Inequality* of the *Temper* of the *Aire*.

812

The *Predictions* likewise of *Cold* and *Long Winters*, and *Hot* and *Dry Summers*, are good to be knowne; As well for the *Discovery* of the *Causes*, as for diuers *Provisions*. That of *Plenty* of *Hawes*, and *Heps*, and *Briar-Berries*, hath beene spoken of before. If *Wainscoat*, or *Stone*, that haue vsed to Sweat, be more dry, in the *Beginning* of *Winter*; Or the *Drops* of the *Eaves* of *Houses* come more slowly downe, than they vse; it portendeth a *Hard* and *Frosty Winter*. The *Cause* is, for that it sheweth an *Inclination* of the *Aire*, to *Dry Weather*; which in *Winter* is euer ioy-  
ned with *Frost*.

813

Generally, a *Moist* and *Cool Summer*, portendeth a *Hard Winter*. The *Cause* is, for that the *Vapours* of the *Earth*, are not dissipated in the *Summer* by the *Sunne*; And so they rebound vpon the *Winter*.

814

A *Hot* and *Dry Summer*, and *Autumne*, and especially if the *Heat* and *Drought* extend farre into *September*, portendeth an *Open Beginning* of *Winter*; And *Colds* to succeed, toward the latter Part of the *Winter*, and the *Beginning* of the *Spring*: For till then, the former *Heat* and *Drought* beare the *Sway*; And the *Vapours* are not sufficiently *Multiplied*.

815

An *Open* and *Warmed Winter* portendeth a *Hot* and *Dry Summer*: For the *Vapours* disperse into the *Winter Showers*; Whereas *Cold* and *Frost* keepeth



keepeth them in, and transporteth them into the late *Spring*, and *Summer* following.

*Birds* that use to change *Countries*, at certaine *Seasons*, if they come Earlier, doe shew the *Temperature* of *Weather*, according to that *Country* whence they came: As the *Winter-Birds*, (namely *Woodcocks*, *Feldsfares*, &c.) if they come earlier, and out of the *Northerne Countries*, with vs shew *Cold Winters*. And if it be in the same *Country*, then they shew a *Temperature* of *Season*, like vnto that *Season* in which they come: As *Swallows*, *Bats*, *Cuckoos*, &c. that come towards *Summer*, if they come early, shew a *Hot Summer* to follow.

816

The *Prognostickes*, more Immediate, of *Weather* to follow soone after, are more Certaine than those of *Seasons*. The *Resounding* of the *Sea* vpon the *Shore*; And the *Murmur* of *Winds* in the *Woods*, without apparent *Wind*; shew *Wind* to follow: For such *Winds*, breathing chiefly out of the *Earth*, are not at the first perceiued, except they be pent, by *Water*, or *Wood*. And therefore a *Murmur* out of *Canes* likewise portendeth as much.

817

The *Upper Regions* of the *Aire*, perceine the *Collection* of the *Matter* of *Tempest*, and *Winds*, before the *Aire* here below: And therefore the *Obscuring* of the *Smaller Stars* is a *Signe* of *Tempests* following. And of this kinde you shall finde a Number of *Instances* in our *Inquisition De Ventis*.

818

*Great Mountaines* haue a *Perception* of the *Disposition* of the *Aire* to *Tempests*, sooner than the *Valleys* or *Plaines* below: And therefore they say in *Wales*, when certaine *Hills* haue their *Night-Caps* on, they meane *Mischief*. The *Cause* is, for that *Tempests*, which are for the most Part bred aboue, in the *Middle Region*, (as they call it,) are soonest perceiued to collect in the *Places* next it.

819

The *Aire*, and *Fire*, haue *Subtill Perceptions* of *Wind Rising*, before *Men* finde it. We see the *Trembling* of a *Candle* will discover a *Wind* that otherwise we doe not feele; And the *Flexuous Burning* of *Flames* doth shew the *Aire* beginneth to be vnquiet; And so doe *Coales* of *Fire* by Casting off the *Ashes* more than they vse. The *Cause* is, for that no *Wind*, at the first, till it hath strooke and driuen the *Aire*, is Apparent to the *Sense*: But *Flame* is easier to moue, than *Aire*: And for the *Ashes*, it is no maruell, though *Wind* vnperceiued shake them off; For we usually trie, which way the *Wind* bloweth, by casting vp *Grasse*, or *Chaffe*, or such light Things, into the *Aire*.

820

When *Wind* expireth from vnder the *Sea*; As it causeth some *Resounding* of the *Water*, (whereof we spake before,) so it causeth some *Light Motions* of *Bubbles*, and *White Circles* of *Froth*. The *Cause* is, for that the *Wind* cannot be perceiued by the *Sense*, vntill there be an *Eruption* of a great *Quantitie*, from vnder the *Water*; And so it getteth into a *Buile*; Whereas in the first *Passing* up it commeth in little *Portions*.

821

We spake of the *Ashes*, that *Coales* cast off; And of *Grasse*, and *Chaffe* carried by the *Wind*; So any *Light Thing* that moueth, when we finde no

822

Wind.



*Wind*, sheweth a *Wind* at hand: As when *Feathers*, or *Downe* of *Thistles*, fly to and fro in the *Aire*.

For *Prognostickes* of *Weather* from *Living Creatures*, it is to be noted; That *Creatures* that live in the *Open Aire*, (*Sub Dio*), must needs have a *Quicker Impression* from the *Aire*, than *Men* that live most within *Doores*; And especially *Birds*, who live in the *Aire*, freest, and clearest; And are aptest by their *Voyce* to tell *Tales*, what they finde; And likewise by the *Motion* of their *Flight* to expresse the same.

*Water-Fowles*, (as *Sea-Gulls*, *Mare-Hens*, &c.) when they focke and fly together, from the *Sea* towards the *Shoares*, And contrariwise, *Land-Birds*, (as *Crowes*, *Swallows*, &c.) when they fly from the *Land* to the *Waters*, and beat the *Waters* with their *Wings*; doe fore-shew *Raine*, and *Wind*. The Cause is, *Pleasure*, that both *Kindes* take in the *Moistnesse*, and *Density* of the *Aire*: And so desire to be in *Motion*, and vpon the *Wing*, whither soever they would otherwise goe. For it is no Maruell, that *Water-Fowle* doe ioy most in that *Aire*, which is likest *Water*; And *Land-Birds* also, (many of them,) delight in *Bathing*, and *Moist Aire*. For the same Reason also, many *Birds* doe proine their *Feathers*; And *Geese* doe gaggle; And *Crowes* seeme to call vpon *Raine*: All which is but the *Comfort* they seeme to receive in the *Releusing* of the *Aire*.

The *Heron*, when shee soareth high, (so as sometimes shee is seene to passe over a *Cloud*;) sheweth *Winds*: But *Kites* flying aloft, shew *Faire* and *Drie Weather*. The Cause may be, for that they both mount most into the *Aire*, of that Temper, wherein they delight: And the *Heron*, being a *Water-Fowle*, taketh pleasure in the *Aire*, that is *Condensed*: And besides, being but Heavie of *Wing*, needeth the Helpe of the *Grosser Aire*. But the *Kite* affecteth not so much the *Grossenesse* of the *Aire*, as the *Cold* and *Freshnesse* thereof; For being a *Bird of Prey*, and therefore *Hot*, shee delighteth in the *Fresh Aire*; And (many times) flyeth against the *Wind*; As *Trents*, and *Salmons* swimme against the *Stream*. And yet it is true also, that all *Birds* finde an Ease in the depth of the *Aire*; As *Swimmers* doe in a *Deepe Water*. And therefore when they are aloft, they can vphold themselves with their *Wings Spread*, scarce moving them.

*Fishes*, when they play towards the *Top* of the *Water*, doe commonly foretell *Raine*. The Cause is, for that a *Fish* hating the *Drie*, will not approach the *Aire*, till it groweth *Moist*; And when it is *Drie*, will fly it, and swimme Lower.

*Beasts* doe take *Comfort*, (generally,) in a *Moist Aire*; And it maketh them eat their *Meat* better; And therefore *Sheepe* will get vp betimes in the *Morning*, to feed, against *Raine*: And *Cattell*, and *Deere*, and *Conies*, will feed hard before *Raine*: And a *Heifer*, will put vp his *Nose*, and snuffe in the *Aire*, against *Raine*.



The *Trifoile*, against *Raine*, swelleth in the *Stalke*; and so standeth more vpright; For by *Wet*, *Stalkes* doe erect, and *Leaues* bow downe. There is a Small Red *Flower* in the *Stubble-Fields*, which Country People call the *Wincopie*; Which if it open in the *Morning*, you may be sure of a faire *Day* to follow.

827

Euen in *Men*, *Aches*, and *Hurts*, and *Cornes*, doe engrieue, either towards *Raine*, or towards *Frost*: For the one maketh the *Humours* more to Abound; And the Other maketh them Sharper. So we see both *Extremes* bring the *Gout*.

828

*Wormes*, *Vermine*, &c. doe fore-shew (likewise) *Raine*: For *Earth-wormes* will come forth, and *Moules* will cast vp more, and *Fleas* bite more, against *Raine*.

829

*Solide Bodies* likewise fore-shew *Raine*. As *Stones*, and *Wainscot*, when they *Sweat*: And *Boxes*, and *Pegs* of *Wood*, when they *Draw*, and *Windle* hard; Though the Former be but from an Outward Cause; For that the *Stone*, or *Wainscot*, turneth and beareth backe the *Aire* against it selfe; But the latter is an *Inward Swelling* of the *Body* of the *Wood* it selfe.

830

**A**ppetite is moued chiefly by Things that are *Cold*, and *Drie*: The Cause is, for that *Cold* is a Kinde of *Indigence* of *Nature*, and calleth vpon Supply; And so is *Drinesse*: And therefore all *Soure Things*, (as *Vinegar*, *Iuyce* of *Limons*, *Oyle* of *Vitrioll*, &c.) prouoke *Appetite*. And the *Dis-ease*, which they call *Appetitus Caninus*, consisteth in the *Matter* of an *Acide* & *Glassie Flegme*, in the *Mouth* of the *Stomach*. *Appetite* is also moued by *Soure Things*; For that *Soure Things*, induce a *Contraction* in the *Nerves*, placed in the *Mouth* of the *Stomach*; Which is a great Cause of *Appetite*. As for the Cause, why *Onions*, and *Salt*, and *Pepper*, in Baked Meats, moue *Appetite*, it is by *Vellication* of those *Nerves*; For *Motion* whetteth. As for *Worme-wood*, *Oliues*, *Capers*, and others of that kinde, which participate of *Bitternesse*, they moue *Appetite* by *Abster-sion*. So as there be foure Principall Causes of *Appetite*; The *Refrigeration* of the *Stomach*, ioyned with some *Drinesse*; *Contraction*; *Vellication*; And *Abster-sion*: Besides *Hunger*, which is an *Emptinesse*: And yet *Ouer-Fasting* doth (many times) cause the *Appetite* to cease; For that *Want* of *Meat* maketh the *Stomach* draw *Humours*; And such *Humours* as are *Light*, and *Cholericke*, which quench *Appetite* most.

Experiment Solitary, touching the Nature of Appetite in the Stomach.

831

**I**t hath been obserued by the *Ancients*, that where a *Rain-Bow* seemeth to hang ouer, or to touch, there breatheth forth a *Sweet Smell*. The Cause is, for that this happeneth but in certaine Matters, which haue in themselves some *Sweetnesse*; Which the *Gentle Dew* of the *Raine-Bow* doth draw forth: And the like doe *Soft Showers*; For they also make the *Grounds* Sweet: But none are so delicate as the *Dew* of the *Rain-Bow*, where it falleth. It may be also, that the *Water* it selfe hath some *Sweetnesse*: For the *Raine-Bow* consisteth of a *Glomeration* of *Small Drops*, which cannot possibly fall, but from the *Aire*, that is very *Low*; And there-

Experiment Solitary, touching Sweetnesse of Odour from the Raine-bow.

832



therefore may hold the very *Sweetnesse* of the *Herbs*, and *Flowers*, as a *Distilled Water*: For *Raine*, and other *Dew*, that fall from high, cannot preserve the *Smell*, being dissipated in the drawing vp: Neither doe we know, whether some *Water* it selfe, may not haue some degree of *Sweetnesse*. It is true, that we finde it sensibly in no *Poole*, *Riuer*, nor *Fountaine*; But good *Earth*, newly turned vp, hath a *Freshnesse*, and good *Sent*; Which *water*, if it be not too *Equall*, (For *Equall Obiects* neuer moue the *Sense*.) may also haue. Certaine it is, that *Bay-Salt*, which is but a kinde of *Water Congealed*, will sometimes smell like *Violets*.

Experiment  
Solitary tou-  
ching Sweet  
Smells.

833

**T**O *Sweet Smells* *Heat* is requisite, to Concoct the *Matter*; And some *Moisture* to Spread the *Breath* of them. For *Heat*, we see that *Woods*, and *Spices*, are more *Odorate* in the *Hot Countries*, than in the *Cold*: For *Moisture*, we see that *Things* too much *Dried*, lose their *Sweetnesse*: And *Flowers* growing, smell better in a *Morning*, or *Evening*, than at *Noone*. Some *Sweet Smells* are destroyed by Approach to the *Fire*; As *Violets*, *Wall-Flowers*, *Gilly-Flowers*, *Pinckes*; And generally all *Flowers* that haue *Cool* and *Delicate Spirits*. Some continue both on the *Fire*, and from the *Fire*, As *Rose-Water*, &c. Some doe scarce come forth, or at least not so pleasantly, as by meanes of the *Fire*; as *Iuniper*, *Sweet Gums*, &c. And all *Smells*, that are *Enclosed* in a *Fast Body*: But (generally) those *Smells* are the most *Gratefull*, where the *Degree* of *Heat* is *Small*; Or where the *Strength* of the *Smell* is allayed; For these *Things* doe rather woove the *Sense*, than *Satiate* it. And therefore the *Smell* of *Violets*, and *Roses*, exceedeth in *Sweetnesse* that of *Spices*, and *Gummes*; And the *Strongest* Sort of *Smells*, are best in a weft, a farre off.

Experiment  
Solitary tou-  
ching the Cor-  
poreall Substance  
of Smells.

834

**I**T is certaine, that no *Smell* issueth, but with *Emission* of some *Corporeall Substance*; Not as it is in *Light*, and *Colours*, and in *Sounds*. For we see plainly, that *Smell* doth spread nothing that distance, that the other doe. It is true, that some *Woods* of *Orenge*, and *Heathes* of *Rose-Mary*, will Smell a great way into the *Sea*, perhaps twenty Miles; But what is that, since a *Peale* of *Ordnance* will doe as much, which moueth in a small compasse? Whereas those *Woods*, and *Heathes*, are of *Vast Spaces*: Besides wee see that *Smells* doe adhere to *Hard Bodies*; As in *Perfuming* of *Gloves*, &c. which sheweth them *Corporeall*; And doe Last a great while, which *Sounds*, and *Light* doe not.

Experiment  
Solitary tou-  
ching Fetide  
and Fragrant  
Odours.

835

**T**He *Excrements* of most *Creatures* Smell ill; Chiefly to the same *Creature* that voideth them: For we see, besides that of *Man*, that *Pigeons*, and *Horses* thrive best, if their *Houses*, and *Stables* be kept *Sweet*; And so of *Cage-Birds*: And the *Cat* burieth that which shee voydeth: And it holdeth chiefly in those *Beasts*, which feed vpon *Flesh*. *Dogs* (almost) onely of *Beasts*, delight in *Fetide Odours*; Which sheweth there is somewhat in their *Sense* of *Smell*, differing from the *Smells* of other *Beasts*. But the *Cause*, why *Excrements* smell ill, is manifest; For that the

Body



*Body* it selfe reiected them; Much more the *Spirits*: And we see, that those *Excrements*, that are of the *First Digestion*, Smell the worst; As the *Excrements* from the *Belly*: Those that are from the *Second Digestion*, lesse ill; As *Urine*; And those that are from the *Third*, yet lesse; For *Sweat* is not so bad, as the other two; Especially of some *Persons*, that are full of *Heat*. Likewise most *Putrefactions* are of an *Odious Smell*: For they smell either *Fetide*, or *Mouldy*. The *Cause* may be, for that *Putrefaction* doth bring forth such a *Consistence*, as is most Contrary to the *Consistence* of the *Body*, whilst it is Sound: For it is a meere dissolution of that *Forme*. Besides, there is another Reason which is Profound: And it is that the *Objects* that please any of the *Senses*, haue (all) some *Equality*, and (as it were) *Order*, in their *Composition*: But where those are wanting, the *Object* is euer Ingrate. So *Mixture* of many *Disagreeing Colours* is euer vnpleasant to the *Eye*: *Mixture* of *Discordant Sounds* is vnpleasant to the *Eare*: *Mixture*, or *Hotch-Potch* of many *Tastes*, is vnpleasant to the *Taste*: *Harshnesse* and *Ruggednesse* of *Bodies*, is vnpleasant to the *Touch*: Now it is certaine, that all *Putrefaction*, being a *Dissolution* of the first *Forme*, is a meere *Confusion*, and *Vnformed Mixture* of the *Part*. Neuerthelesse, it is strange, and seemeth to Crosse the former *Observation*, that some *Putrefactions* and *Excrements* doe yeeld *Excellent Odours*; As *Civet* and *Muske*; And as some thinke *Amber-Greece*: For diuers take it, (though vnprobably) to come from the *Sperme* of *Fish*: And the *Mosse* we spake of from *Apple-Trees*, is little better than an *Excretion*. The Reason may be, for that there passeth in the *Excrements*, and remaineth in the *Putrefactions*, some good *Spirits*; especially where they proceed from *Creatures*, that are very *Hot*. But it may be also ioyned with a further *Cause*, which is more Subtill; And it is, that the *Senses* loue not to be Ouerpleased; But to haue a *Commixture* of somewhat that is in it selfe Ingrate. Certainly, we see how *Discords* in *Musicke*, falling vpon *Concords*, make the *Sweetest Straines*: And we see againe, what Strange *Tastes* delight the *Taste*; As *Red-Herrings*, *Cauery*, *Parmizan*, &c. And it may be, the same holdeth in *Smels*. For those kinde of *Smels*, that we haue mentioned, are all Strong, and doe Pull and Vellicate the *Sense*. And wee finde also, that *Places* where Men *Urine*, commonly haue some *Smell* of *Violets*: And *Urine*, if one hath eaten *Nutmeg*, hath so too.

The Sloathfull, Generall, and Indefinite *Contemplations*, and *Notions*, of the *Elements*, and their *Coniugations*; Of the *Influences* of *Heauen*; Of *Heat*, *Cold*, *Moisture*, *Drought*; *Qualities* *Actiue*, *Passiue*; And the like; haue swallowed vp the true *Passages*, and *Processes*, and *Affects*, and *Consistences* of *Matter*, and *Naturall Bodies*. Therefore they are to be set aside, being

T

but



but *Notionall*, and *ill Limited*; And *Definite Axiomes* are to be drawne out of *Measured Instances*: And so Assent to be made to the more *Generall Axiomes*, by *Scale*. And of these *Kindcs of Processes of Natures*, and *Characters of Matter*, we will now set downe some *Instances*.

Experiment  
Solitary, touch-  
ing the Cau-  
ses of Putrefa-  
ction.

836

**A**LL *Putrefactions* come chiefly from the *Inward Spirits* of the *Body*; And partly also from the *Ambient Body*, be it *Aire*, *Liquor*, or what-soever else. And this last, by two *Meanes*: Either by *Ingresse* of the *Substance* of the *Ambient Body*, into the *Body Putrified*; Or by *Excitation* and *Sollicitation* of the *Body Putrified*, and the *Parts* thereof, by the *Body Ambient*. As for the *Receiued Opinion*, that *Putrefaction* is caused, either by *Cold*, or *Peregrine* and *Preternaturall Heat*, it is but *Nugation*: For *Cold* in *Things Inanimate*, is the greatest *Enemy* that is, to *Putrefaction*; though it extinguisheth *Vinification*, which euer consisteth in *Spirits Attenuate*, which the *Cold* doth congeale, and coagulate. And as for the *Peregrine Heat*, it is thus farre true; That if the *Proportion* of the *Aduentine Heat*, be greatly *Predominant*, to the *Naturall Heat*, and *Spirits* of the *Body*, it tendeth to *Dissolution*, or *Notable Alteration*. But this is wrought by *Emission*, or *Suppression*, or *Suffocation*, of the *Natine Spirits*; And also by the *Disordination*, and *Discomposture* of the *Tangible Parts*; And other *Passages of Nature*; And not by a *Conflict* of *Heats*.

Experiment  
Solitary touch-  
ing Bodies  
Vnperfectly  
Mixt.

837

**I**N *Versions*, or *Maine Alterations* of *Bodies*, there is a *Medium* betweene the *Body*, as it is at first, and the *Body Resulting*; which *Medium* is *Corpus imperfectè Mistum*, and is *Transitory*, and not durable; As *Mists*, *Smokes*, *Vapours*, *Chylus* in the *Stomach*, *Living Creatures* in the first *Vinification*: And the *Middle Action*, which produceth such *Imperfect Bodies*, is fitly called (by some of the *Ancients*) *Inquination*, or *Inconcoction*, which is a *Kindc of Putrefaction*; For the *Parts* are in *Confusion*, till they settle, one way, or other.

Experiment  
Solitary touch-  
ing Concocti-  
on and Crudity.

838

**T**He word *Concoction*, or *Digestion*, is chiefly taken into vse from *Living Creatures*, and their *Organs*; And from thence extended to *Liquors*, and *Fruits*, &c. Therefore they speake of *Meat Concocted*; *Urine* and *Excrements Concocted*; And the *Four Digestions*, (In the *Stomach*; In the *Liver*; In the *Arteries* and *Nerves*; And in the *Generall Parts* of the *Body*;) are likewise called *Concoctions*: And they are all made to be the *Workes of Heat*: All which *Notions* are but ignorant *Catches* of a few *Things*, which are most *Obuius* to *Mens Observations*. The *Constantest Notion* of *Concoction* is, that it should signifie the *Degrees of Alteration*, of one *Body* into another, from *Crudity* to perfect *Concoction*; Which is the *Vltimity* of that *Action* or *Processe*: And while the *Body* to be *Conuerted* and *Altered*, is too strong for the *Efficient*, that should *Conuert*, or *Alter* it, (whereby it resisteth and holdeth fast in some degree the first

Forme,



*Forme, or Consistence*) it is (all that while) *Crude, and Inconcoct*; And the *Processe* is to be called *Crudity and Inconcoction*. It is true, that *Concoction* is, in great part, the *Worke of Heat*; But not the *Worke of Heat* alone: For all Things, that further the *Conversion, or Alteration*, (as *Rest, Mixture of a Body already Concocted, &c.*) are also *Meanes to Concoction*. And there are of *Concoction* two *Periods*; The one *Assimilation, or Absolute Conversion and Subaction*; The other *Maturation*: whereof the Former is most conspicuous in the *Bodies of Living Creatures*; In which there is an *Absolute Conversion, and Assimilation of the Nourishment into the Body*: And likewise in the *Bodies of Plants*: And againe in *Metals*, where there is a full *Transmutation*. The other (which is *Maturation*) is seen in *Liquors, and Fruits*; wherein there is not desired, nor pretended, an utter *Conversion*, but only an *Alteration* to that *Forme*, which is most sought for *Mans use*; As in *Clarifying of Drinckes*; *Ripening of Fruits, &c.* But note, that there be two *Kindes of Absolute Conversions*; The one is, when a *Body* is converted into another *Body*, which was before; As when *Nourishment* is turned into *Flesh*; That is it which we call *Assimilation*. The other is, when the *Conversion* is into a *Body* meerely New; and which was not before; As if *Silver* should be turned to *Gold*; or *Iron* to *Copper*: And this *Conversion* is better called, for distinctions sake, *Transmutation*.

There are also diuers other *Great Alterations of Matter, and Bodies*, besides those that tend to *Concoction, and Maturation*; For whatsoever doth so alter a *Body*, as it returneth not againe to that it was, may be called *Alteratio Maior*: As when *Meat* is Boiled, or Roasted, or Fried, &c. Or when *Bread* and *Meat* are Baked; Or when *Cheese* is made of *Curds, or Butter of Creame, or Coales of Wood, or Bricks of Earth*; And a Number of others. But to apply *Notions Philosophicall* to *Ploweian termes*; Or to say, where the *Notions* cannot fitly be reconciled, that there wanteth a *Terme, or Nomenclature* for it; (as the *Ancients* vsed;) They be but *Shifts of Ignorance*; For *Knowledge* will be euer a *Wandering and Indigested Thing*, if it be but a *Commixture* of a few *Notions*, that are at hand and occure, and not excited from sufficient Number of *Instances*, and those well collated.

The *Consistences of Bodies* are very diuers: *Dense, Rare, Tangible, Pneumaticall, Volatile, Fixed, Determinate, Not Determinate, Hard, Soft, Cleaving, Not Cleaving, Congealeable, Not Congealeable, Liquefiable, Not Liquefiable, Fragile, Tough, Flexible, Inflexible, Tractile, or to be drawne forth in length, Intractile, Porous, Solid, Equall, and Smooth, Vnequall, Venous, and Fibrous,*

Experiment  
Solitary touching  
Alterations, which may  
bee called  
Maiors.

839



brow, and with Graines, Entire; And diuers Others; All which to referre to *Heat*, and *Cold*; and *Moisture*, and *Drought*, is a Compendious and Inutile Speculation. But of these see principally our *Abecedarium Naturæ*; And otherwise *Sparsum* in this our *Sylua Sylvarum*: Neuerthelesse in some good part, We shall handle diuers of them now presently.

Experiment  
Solitary, tou-  
ching Bodies Li-  
quefiable, and  
not Liquefiable.

840

**L**iquefiable, and Not Liquefiable, proceed from these Causes: *Liquefaction* is euer caused by the Detention of the Spirits, which play within the Body, and Open it. Therefore such Bodies as are more Turgide of Spirit; Or that haue their Spirits more Straitly Imprisoned; Or againe that hold them Better Pleased, and Content; are Liquefiable: For these three Dispositions of Bodies, doe arrest the Emission of the Spirits. An Example of the first two Properties is in Metals; And of the Last in Grease, Pitch, Sulphure, Butter, Wax, &c. The Disposition not to Liquefie proceedeth from the Easie Emission of the Spirits, whereby the Grosser Parts contract; And therefore, Bodies leuine of Spirits; Or which part with their Spirits more Willingly; are not Liquefiable; As Wood, Clay, Free-Stone, &c. But yet, euen many of those Bodies, that will not Melt, or will hardly Melt, will notwithstanding Soften; As Iron in the Forge; And a Sticke bathed in Hot Ashes, which thereby becommeth more Flexible. Moreouer, there are some Bodies, which doe Liquefie, or dissolue by Fire; As Metals, Wax, &c. And other Bodies, which dissolue in Water; As Salt, Sugar, &c. The Cause of the former proceedeth from the Dilatation of the Spirits by Heat: The Cause of the Latter proceedeth from the Opening of the Tangible Parts, which desire to receiue the Liquor. Again, there are some Bodies, that dissolue with both; As Gumme, &c. And those be such Bodies, as on the One Side haue good store of Spirit; And on the other Side, haue the Tangible Parts Indigent of Moisture; For the former helpeth to the Dilating of the Spirits by the Fire; And the Latter stimulateth the Parts to Receiue the Liquor.

Experiment  
Solitary, tou-  
ching Bodies  
Fragile, and  
Tough.

841

**O**F Bodies, some are Fragile; And some are Tough, and Not Fragile; And in the Breaking, some Fragile Bodies break but where the Force is; Some shatter and fly in many Peeeces. Of Fragility the Cause is an Impotency to be Extended: And therefore Stone is more Fragile than Metall; And so Fictile Earth is more Fragile than Crude Earth; And Dry Wood than Greene. And the Cause of this Vnaptnesse to Extension, is the Small Quantity of Spirits; (For it is the Spirit that furthereth the Extension or Dilatation of Bodies;) And it is euer Concomitant with Porosity, and with Driness in the Tangible Parts: Contrariwise, Tough Bodies haue more Spirit, and fewer Pores, and Moister Tangible Parts: Therefore we see that Parchment, or Leather will stretch, Paper will not; Woollen Cloth will center, Linnen scarcely.

All



**A**LL Solid Bodies consist of Parts of two severall Natures; *Pneumaticall*, and *Tangible*; And it is well to be noted, that the *Pneumaticall Substance* is in some Bodies, the *Native Spirit* of the Body; And in some other, plaine *Aire* that is gotten in; As in Bodies *Desiccate*, by *Heat*, or *Age*: For in them, when the *Native Spirit* goeth forth, and the *Moisture* with it, the *Aire* with time getteth into the *Pores*. And those Bodies are ever the more *Fragile*; For the *Native Spirit* is more *Yeelding*, and *Extensive*, (especially to follow the *Parts*,) than *Aire*. The *Native Spirits* also admit great *Diversity*; As *Hot*, *Cold*, *Active*, *Dull*, &c. Whence proceed most of the *Vertues*, and *Qualities* (as wee call them) of Bodies: But the *Aire Intermixt*, is without *Vertues*, and maketh Things *Inspide*, and without any *Extimulation*.

Experiment  
Solitary touching the Two  
Kinds of *Pneumatics* in Bodies.

842

**T**He Concretion of Bodies is (commonly) solued by the *Contrary*; As *Ice*, which is congealed by *Cold*, is dissolued by *Heat*; *Salt* and *Sugar*, which are Excocted by *Heat*, are Dissolued by *Cold*, and *Moisture*. The Cause is, for that these Operations, are rather *Returns* to their former *Nature*, than *Alterations*: So that the *Contrary* cureth. As for *Oyle*, it doth neither easily congeale with *Cold*, nor thicken with *Heat*. The Cause of both Effects, though they be produced by *Contrary Efficientes*, seemeth to be the Same; And that is, because the *Spirit* of the *Oyle*, by either Meanes, exaleth little; For the *Cold* keepeth it in; and the *Heat*, (except it be *Vehement*,) doth not call it forth. As for *Cold*, though it take hold of the *Tangible Parts*, yet as to the *Spirits*, it doth rather make them *Swell*, than *Congeale* them: As when *Ice* is congealed in a *Cup*, the *Ice* will *Swell* in stead of *Contracting*; And sometimes *Rift*.

Experiment  
Solitary touching Concretion, and Dissolution of Bodies.

843

**O**F Bodies, some (we see) are *Hard*, and some *Soft*: The *Hardnesse* is caused (chiefly) by the *Leinenesse* of the *Spirits*; And their *Imparity* with the *Tangible Parts*: Both which, if they be in a greater degree, maketh them not only *Hard*, but *Fragile*, and lesse *Enduring* of *Pressure*; As *Steele*, *Stone*, *Glasse*, *Dry Wood*, &c. *Softnesse* cometh (contrariwise) by the Greater *Quantity* of *Spirits*; (which ever helpeth to Induce *Yeelding* and *Cession*;) And by the more *Equall Spreading* of the *Tangible Parts*, which thereby are more *Sliding*, and *Following*; As in *Gold*, *Lead*, *Wax*, &c. But note that *Soft Bodies*, (as we vse the word,) are of two *Kinds*; The one, that easily giueth place to another *Body*, but altereth not *Bulke*, by *Rising* in other *Places*: And therefore we see that *Wax*, if you put any Thing into it, doth not rise in *Bulke*, but only giueth *Place*: For you may not thinke, that in *Printing* of *Wax*, the *Wax* riseth vp at all; But only the *depressed Part* giueth place, and the other remaineth as it was. The other, that altereth *Bulke* in the *Cession*; As *Water*, or other *Liquors*, if you put a *Stone*, or any Thing into them, they giue place (indeed) easily, but then they rise all ouer: Which is a *False Cession*; For it is in *Place*, and not in *Body*.

Experiment  
Solitary touching *Hard* and *Soft* Bodies.

844



Experiment  
Solitary tou-  
ching Bodies  
Ductile, and  
Tensile.

845

348

Experiment  
Solitary tou-  
ching other  
Passions of Mat-  
ter, and Chara-  
cters of Bodies.

846

**A**LL Bodies Ductile, and Tensile, (as Metals that will be drawne into Wires; Wooll and Tow that will be drawn into Yarne, or Thred) haue in them the Appetite of Not Discontinuing, Strong; Which maketh them follow the Force, that pulleth them out; And yet so, as not to Discontinue or forsake their owne Body. Viscous Bodies, (likewise) as Pitch, Wax, Bird-Lime, Cheese toasted, will draw forth, and rope. But the difference betweene Bodies Fibrous, and Bodies Viscous, is Plaine; For all Wooll, and Tow, and Cotton, and Silke, (especially raw Silke) haue, besides their Desire of Continuance, in regard of the Tenuity of their Thred, a Greedinesse of Moisture; And by Moisture to ioyne and incorporate with other Thred; Especially if there be a little Wreathing; As appeareth by the Twisting of Thred; And the Practise of Twirling about of Spindles. And we see also, that Gold and Silver Thred cannot bee made without Twisting.

**T**HE Differences of Impresible and Not Impresible; Figurable and Not Figurable; Mouldable and Not Mouldable; Scissile and Not Scissile; And many other Passions of Matter, are Plebeian Notions, applied vnto the Instruments and Uses which Men ordinarily practise; But they are all but the Effects of some of these Causes following; Which we will Enumerate without Applying them, because that would be too long. The First is the Cession, or Not Cession of Bodies, into a Smaller Space or Roome, keeping the Outward Bulke, and not flying vp. The Second is the Stronger or Weaker Appetite, in Bodies, to Continuity, and to flie Discontinuitie. The Third is the Disposition of Bodies, to Contract, or Not Contract; And againe, to Extend, or Not Extend. The Fourth is the Small Quantity, or Great Quantity, of the Pneumaticall in Bodies. The Fifth is the Nature of the Pneumaticall, whether it bee Native Spirit of the Body, or Common Aire. The Sixth is, the Nature of the Native Spirits in the Body, whether they be Active and Eager, or Dull and Gentle. The Seuenth is the Emission or Detention of the Spirits in Bodies. The Eighth is the Dilatation, or Contraction of the Spirits in Bodies, while they are detained. The Ninth is the Collocation of the Spirits in Bodies; whether the Collocation be Equall, or Vnequall; And againe, whether the Spirits be Coacernate, or Diffused. The Tenth is the Density, or Raritie of the Tangible Parts. The Eleuenth is the Equality or Inequality of the Tangible Parts. The Twelfth is the Digestion, or Crudity of the Tangible Parts. The Thirteenth is the Nature of the Matter, whether Sulphureous or Mercuriall, Watric or Oylie, Drie and Terrestriall, or Moist and Liquid; which Natures of Sulphureous and Mercuriall, seeme to be Natures Radicall, and Principall. The Fourteenth is the Placing of the Tangible Parts, in Length, or Transuerse; (as it is in the Warpe, and the Woofe of Textiles;) More Inward, or More Outward; &c. The Fifteenth is the Porositie, or Imporosity betwixt the Tangible Parts; And the Greatnesse, or Smallnesse of the Pores. The Sixteenth is the Collocation and Posture of the Pores. There may be more Causes; but these doe occurre for the Present.

Take



**T**Ake *Lead*, and melt it, and in the midst of it, when it beginneth to congeale, make a little Dint, or Hole, and put *Quick-silver* wrapped in a Peece of *Linnen* into that Hole, and the *Quick-silver* will fix, and runne no more, and endure the Hammer. This is a Noble Instance of *Induration*, by Consent of one *Body* with another, and Motion of *Excitation* to *Imitate*; For to ascribe it only to the *Vapour* of *Lead*, is lesse Probable. *Quære* whether the *Fixing* may be in such a degree, as it will be Figured like other *Metalls*? For if so, you may make *Workes* of it for some purposes, so they come not neare the *Fire*.

Experiment  
Solitary touching  
*Induration*  
by *Sympathy*.

847

**S**ugar hath put downe the vse of *Honey*; In so much as wee haue lost those *Observations*, and *Preparations* of *Honey*, which the *Ancients* had, when it was more in Price. First, it seemeth that there was, in old time, *Tree-Honey*, as well as *Bee-Honey*; Which was the *Teare* or *Bloud* issuing from the *Tree*: In so much as one of the *Ancients* relateth, that in *Trebi-sond*, there was *Honey* issuing from the *Box-Trees*, which made *Men* Mad. Againe, in Ancient time, there was a Kinde of *Honey*, which either of the owne Nature, or by Art, would grow as Hard as *Sugar*; And was not so Lushious as Ours. They had also a *Wine* of *Honey*, which they made thus. They crushed the *Honey* into a great *Quantitie* of *Water*, and then strained the *Liquor*; After they boyled it in a Copper to the halfe: Then they powred it into *Earthen Vessels*; for a small time; And after tunned it into *Vessels* of *Wood*, and kept it for many yeares. They haue also, at this day, in *Russia*, and those *Northerne Countries*, *Mead Simple*, which (well made, and seasoned) is a good wholesome *Drink*, and very Cleare. They vse also in *Wales*, a Compound *Drinke* of *Mead*, with *Herbs*, and *Spices*. But meane-while it were good, in recompence of that wee haue lost in *Honey*, there were brought in vse a *Sugar-Mead*, (for so we may call it,) though without any *Mixture* at all of *Honey*; And to brew it, and keepe it stale, as they vse *Mead*; For certainly, though it would not be so *Abstersiue*, and *Opening*, and *Solutiue* a *Drinke*, as *Mead*; yet it will be more gratefull to the *Stomach*, and more *Lenitiue*, and fit to be vsed in *Sharpe Diseases*: For we see, that the vse of *Sugar* in *Beere*, and *Ale*, hath good *Effects* in such Cases.

Experiment  
Solitary touching  
*Honey*  
and *Sugar*.

848

**I**T is reported by the *Ancients*, that there was a Kinde of *Steele*, in some places, which would polish almost as white and bright as *Silver*. And that there was in *India* a Kinde of *Brasse*, which (being polished) could scarce be discerned from *Gold*. This was in the *Naturall Vre*; But I am doubtfull, whether *Men* haue sufficiently refined *Metalls*, which wee count *Base*; As whether *Iron*, *Brasse*, and *Tin*, be refined to the Heighth? But when they come to such a Finenesse, as serueth the ordinary vse, they trie no further.

Experiment  
Solitary touching the *Finer*  
Sort of *Base*  
*Metalls*.

849

**T**Here haue beene found certaine *Cements* vnder *Earth*, that are very Soft; And yet, taken forth into the *Sun*, harden as Hard as *Marble*:

Experiment  
Solitary, touching  
*Cements*  
and *Quarries*.

There

850



There are also ordinary *Quarries* in *Somerset-Shire*, which in the *Quarry* cut soft to any *Bignesse*, and in the *Building* prove firme, and hard.

Experiment  
Solitary touching the  
Altering of the Colour of  
Haires and Feathers.

851

**L**iving Creatures (generally) doe change their *Haire* with *Age*, turning to be *Gray* and *White*: As is seene in *Men*, though some *Earlier*, some *Later*; In *Horses*, that are *Dappled*, and turne *White*; In *Old Squirrels*, that turne *Grisly*; And many others. So doe some *Birds*; As *Cygnets*, from *Gray* turne *White*; *Hawkes*, from *Browne* turne more *White*: And some *Birds* there be, that vpon their *Moulting*, doe turne *Colour*; As *Robin-Redbreasts*, after their *Moulting*, grow to be *Red* againe, by degrees; So doe *Gold-Finches* vpon the *Head*. The cause is, for that *Moisture* doth (chiefly) colour *Haire*, and *Feathers*; And *Drinesse* turneth them *Gray* and *White*; Now *Haire* in *Age* waxeth *Drier*: So doe *Feathers*. As for *Feathers*, after *Moulting*, they are *Young Feathers*, and so all one as the *Feathers* of *Young Birds*. So the *Beard* is younger than the *Haire* of the *Head*, and doth (for the most part,) wax *Hoare* later. Out of this Ground, a *Man* may deuise the *Meanes* of *Altering* the *Colour* of *Birds*, and the *Retardation* of *Hoare-Haires*. But of this see in the fifth *Experiment*.

Experiment  
Solitary touching the  
Differences of Living  
Creatures, Male and  
Female.

852

**T**He Difference betweene *Male* and *Female*, in some *Creatures*, is not to be discerned, otherwise than in the *Parts* of *Generation*: As in *Horses* and *Mares*, *Dogges* and *Bitches*, *Dones* *He* and *She*, and others. But some differ in *Magnitude*, and that diuersly; For in most the *Male* is the greater; As in *Man*, *Pheasants*, *Peacocks*, *Turkey's*; and the like: And in some few, as in *Hawkes*, the *Female*. Some differ in the *Haire*, and *Feathers*, both in the *Quantitie*, *Crispation*, and *Colours* of them; As *He-Lions* are *Hirsute*, and haue great *Maines*; The *She's* are smooth like *Cats*. *Bulls* are more *Crispe* vpon the *Fore-head* than *Cowes*; The *Peacocke*, and *Pheasant-Cocke*, and *Gold-Finch-Cocke*, haue glorious and fine *Colours*; The *Henn's* haue not. Generally, the *Hees* in *Birds* haue the fairest *Feathers*. Some differ in diuers *Features*; As *Buckes* haue *Hornes*, *Doe's* none; *Rammes* haue more *wreathed Hornes* than *Ewes*; *Cockes* haue great *Combes* and *Spurres*, *Hens* little or none; *Boares* haue great *Fangs*, *Sowes* much lesse; The *Turkey-Cocke* hath great and *Swelling Gills*, the *Hen* hath lesse; *Men* haue generally *Deeper* and *Stronger Voyces* than *Women*. Some differ in *Facultie*; As the *Cockes* amongst *Singing Birds*, are the best *Singers*. The *Chiefe Cause* of all these, (no doubt,) is, for that the *Males* haue more *Strength* of *Heat* than the *Females*; Which appeareth manifestly in this, that all young *Creatures* *Males*, are like *Females*; And so are *Eunuchs*, and *Gels* *Creatures* of all kindes, liker *Females*. Now *Heat* causeth *Greatnesse* of *Growth*, generally, where there is *Moisture* enough to worke vpon: But if there be found in any *Creature*, (which is seene rarely,) an *Ouer-great Heat* in proportion to the *Moisture*, in them the *Female* is the greater; As in *Hawkes*, and *Sparrowes*. And if the *Heat* be ballanced with the *Moisture*, then there is no difference to be seene betweene *Male* and *Female*:



male: As in the *Instances* of *Horses*, and *Dogges*. We see also, that the *Hornes* of *Oxen*, and *Cowes*, for the most part, are Larger than the *Bulls*; which is caused by abundance of *Moisture*, which in the *Hornes* of the *Bull* faileth. Againe, *Heat* causeth *Pilosity*, and *Crispation*; And so likewise *Beards* in *Men*. It also expelleth finer *Moisture*, which Want of *Heat* cannot Expell: And that is the Cause of the *Beauty* and *Variety* of *Feathers*: Againe, *Heat* doth put forth many *Excrescences*, and much *Solide Matter*, which Want of *Heat* cannot do: And this is the Cause of *Hornes*, and of the *Greatnesse* of them; And of the *Greatnesse* of the *Combes* and *Spurres* of *Cockes*, *Gills* of *Turky-Cockes*, and *Fangs* of *Boares*. *Heat* also dilateth the *Pipes*, and *Organs*, which causeth the *Deepeenesse* of the *Voice*. Againe, *Heat* refineth the *Spirits*, and that causeth the *Cock-Singing Bird*, to Excell the *Hen*.

**T** Here be *Fishes* greater than any *Beasts*; As the *Whale* is farre greater than the *Elephant*. And *Beasts* are (generally) greater than *Birds*. For *Fishes*, the cause may be, that because they Liue not in the *Aire*, they haue not their *Moisture* drawn and Soaked by the *Aire*, and *Sun-Beames*. Also they rest alwayes, in a manner, and are supported by the *Water*; whereas *Motion* and *Labour* doe consume. As for the *Greatnesse* of *Beasts*, more than of *Birds*, it is caused, for that *Beasts* stay Longer time in the *Wombe*, than *Birds*, and there Nourish, and Grow; Whereas in *Birds*, after the *Egge* Lay'd, there is no further *Growth*, or *Nourishment* from the *Female*: For the *Sitting* doth *Finishe*, and not Nourish.

**W** E haue partly touched before the *Meanes* of *Producing Fruits*, without *Coares*, or *Stones*. And this we adde further, that the Cause must be *Abundance* of *Moisture*; For that the *Coare*, and *Stone* are made of a *Drie Sap*: And we see that it is possible, to make a *Tree* put forth only in *Blossome*, without *Fruit*; As in *Cherries* with *Double Flowers*; Much more into *Fruit* without *Stone*, or *Coares*. It is reported, that a *Cions* of an *Apple*, grafted vpon a *Colewort-Stalke*, sendeth forth a great *Apple* without a *Coare*. It is not vnlikely, that if the *Inward Pith* of a *Tree*, were taken out, so that the *Iuyce* came only by the *Barke*, it would work the *Effect*. For it hath beene obserued, that in *Pollards*, if the *Water* get in on the *Top*, and they become *Hollow*, they put forth the more. We adde also, that it is deliuered for certaine by some, that if the *Cions* be grafted, the *Small End* downwards, it will make *Fruit* haue little or no *Coares*, and *Stones*.

**T** obacco is a thing of great Price, if it be in request. For an *Acre* of it will be worth, (as is affirmed,) two Hundred Pounds, by the yeare, towards Charge. The Charge of making the Ground, and otherwise, is great, but nothing to the Profit. But the *English Tobacco*, hath small credit, as being too *Dull*, and *Earthy*: Nay the *Virginian Tobacco*, though that be in a *Hotter Climate*, can get no credit, for the same Cause: So that

a Triall

Experiment  
Solitary, touching the  
Comparative Magni-  
tude of Living  
Creatures.

853

Experiment  
Solitary, touching  
Exoffiation of Fruits.

854

Experiment  
Solitary touching the  
Melioration of To-  
bacco.

855



a Trial to make Tobacco more *aromaticall*, and better Concocted here in England, were a Thing of great profit. Some haue gone about to doe it by Drenching the *English Tobacco*, in a Decoction or Infusion of *Indian Tobacco*: But those are but Sophistications, and Toyes; For Nothing that is once Perfect, and hath run his Race, can receiue much Amendment. You must euer resort to the Beginnings of Things for *Melioration*. The Way of *Maturation* of Tobacco must, as in other Plants, be, from the Heat, Either of the Earth, or of the Sunne. We see some Leading of this in Musk-Melons; which are sown vpon a Hot Bed, Dugged below, vpon a Bancke turned vpon the South Sunne, to giue Heat by Reflexion; Laid vpon Tiles, which increaseth the Heat; And Couered with Straw to keepe them from Cold. They remoue them also, which addeth some Life: And by these Helpes they become as good in England, as in Italy, or Prouence. These, and the like Meanes, may be tried in Tobacco. Enquire also of the Steeping of the Roots, in some such Liquor, as may giue them Vigour to put forth Strong.

Experiment  
Solitary touching  
seuerall  
Heats, working  
the same Effects.

856

Heat of the Sun for the *Maturation* of Fruits; Yea and the Heat of *Vivification* of *Living Creatures*; are both represented and supplied, by the Heat of Fire; And likewise, the Heats of the Sunne, and Life, are represented one by the other. Trees, set vpon the Backes of Chimneyes, doe ripen Fruit sooner. Vines, that haue bene drawne in at the Window of a Kitchen, haue sent forth Grapes ripe a Month (at least) before others. Stones, at the Backe of Walls, bring forth Oranges here with vs. Egges, as is reported by some, haue bene hatched in the warmth of an Oven. It is reported by the Ancients, that the Estrich Layeth her Eggs vnder Sand, where the Heat of the Sunne discloseth them.

Experiment  
Solitary touching  
Swelling  
and Dilatation  
in Boiling.

857

Barley in the Boiling swelleth not much; Wheat swelleth more; Rize extremely; In so much as a Quarter of a Pint (vnboyled) will arise to a Pint boyled. The Cause (no doubt) is, for that the more Close and Compact the Body is, the more it will dilate: Now Barley is the most Hollow; Wheat more Solide than that; and Rize most Solide of all. It may be also that some Bodies haue a Kinde of Lentour, and more Deperible Nature than others; As we see it euident in Colouration; For a Small Quantitie of Saffron, will Tinct more, than a very great Quantitie of Breffill, or Wine.

Experiment  
Solitary touching  
the Dulcoration  
of  
Fruits.

858

Fruit groweth Sweet by Rowling, or Pressing them gently with the Hand; As Rowling-Peares, Damasins, &c. By Rottenesse; As Medlars, Seruices, Sloes, Hops, &c. By Time; As Apples, Wardens, Pomgranats, &c. By certaine Speciall *Maturations*; As by Laying them in Hay, Straw, &c. And by Fire; As in Roasting, Stewing, Baking, &c. The Cause of the Sweetnesse by Rowling, and Pressing, is *Emollition*, which they properly enduce; As in Beating of Stock-Fish, Flesh, &c. By Rottenesse is, for that the Spirit of the Fruit, by Putrefaction, gather Heat, and thereby digest the



the Harder Part: For in all *Putrefactions*, there is a *Degree of Heat*. By *Time* and *Keeping* is, because the *Spirits* of the *Body*, doe euer feed vpon the *Tangible Parts*, and attenuate them. By *Seuerall Maturations* is, by some *Degree of Heat*. And by *Fire* is, because it is the Proper Worke of *Heat* to Refine, and to Incorporate; And all *Sourenesse* consisteth in some *Grossenesse* of the *Body*: And all *Incorporation* doth make the *Mixture* of the *Body*, more *Equall*, in all the *Parts*; Which euer induceth a *Milder Taste*.

**O**F *Fleshes*, some are *Edible*; Some, except it be in *Famine*, not. For those that are not *Edible*, the *Cause* is, for that they haue (commonly) too much *Bitternesse of Taste*; And therefore those *Creatures*, which are Fierce and *Cholericke*, are not *Edible*; As *Lions*, *Wolues*, *Squirrells*, *Dogs*, *Foxes*, *Horses*, &c. As for *Kine*, *Sheepe*, *Goats*, *Deere*, *Swine*, *Conneyes*, *Hares*, &c. We see they are *Milde*, and *Fearfull*. Yet it is true, that *Horses*, which are *Beasts* of *Courage*, haue beene, and are eaten by some *Nations*; As the *Scythians* were called *Hippophagi*; And the *Chineses* eat *Horse-flesh* at this day; And some *Gluttons* haue vsed to haue *Colts-flesh* baked. In *Birds*, such as are *Carniuora*, and *Birds of Prey*, are commonly no *Good Meat*; But the Reason is, rather the *Cholericke Nature* of those *Birds*, than their *Feeding* vpon *Flesh*; For *Puits*, *Gulls*, *Shoublers*, *Duckes*, doe feed vpon *Flesh*, and yet are *Good Meat*: And we see, that those *Birds*, which are of *Prey*, or feed vpon *Flesh*, are good *Meat*, when they are very *Young*; As *Blawkes*, *Rookes* out of the *Nest*, *Owles*, &c. *Mans Flesh* is not Eaten. The Reasons are Three: First, because *Men* in *Humani-ty* doe abhorre it: Secondly, because no *Living Creature*, that *Dyeth* of *it selfe*, is good to Eat: And therefore the *Caniballs* (themselves) eat no *Mans-flesh*, of those that *Dye* of *Themselves*, but of such as are *Slaine*. The Third is, because there must be (generally) some *Disparity*, betweene the *Nourishment*, and the *Body Nourished*; And they must not be *Ouer-neere*, or like: Yet we see, that in great *Weaknesse*, and *Consumptions*, *Men* haue beene sustained with *Womans Milke*: And *Ficinus* fondly (as I conceiue) aduise, for the *Prolongation of Life*, that a *Veine* be opened in the *Arme* of some wholesome *Young Man*; And the *Bloud* to be sucked. It is said, that *Witches* doe greedily eat *Mans-flesh*; which if it be true, besides a *Diuellish Appetite* in them, it is likely to proceed, for that *Mans-flesh* may send vp *High and Pleasing Vapours*, which may stirre the *Imagination*; And *Witches Felicitie* is chiefly in *Imagination*, as hath beene said.

**T**Here is an Ancient Receiued *Tradition* of the *Salamander*, that it li- ueth in the *Fire*, and hath force also to extinguish the *Fire*. It must haue two Things, if it be true, to this *Operation*: The One a very *Close Skin*, whereby *Flame*, which in the *Midst* is not so hot, cannot enter: For we see that if the *Palme* of the *Hand* be annointed thicke with *White of Egge*, and then *Aquauiua* be powred vpon it, and Enflamed, yet one may endure the *Flame* a pretty while. The other is some *Extreme Cold* and

Quenching

Experiment  
Solitary, tou-  
ching *Flesh E-*  
*dible*, and not  
*Edible*.

859

Experiment  
Solitary, tou-  
ching the *Sala-*  
*mander*.

860



*Quenching vertue*, in the *Body* of that *Creature*, which choaketh the *Fire*. We see that *Milke* quencheth *Wild-Fire*, better than *Water*, because it entreth better.

Experiment  
Solitary tou-  
ching the Con-  
trary Operations  
of Time, vpon  
Fruits, and Li-  
quors.

861

**T**ime doth change *Fruit*, (as *Apples*, *Pears*, *Pomgranats*, &c.) from more *Sowre*, to more *Sweet*: But contrariwise *Liquors* (euen those that are of the *Iuyce* of *Fruit*) from more *Sweet* to more *Sowre*; As *Wort*, *Must*, *New Verinyce*, &c. The *Cause* is, the *Congregation* of the *Spirits* together: For in both *Kindes*, the *Spirit* is attenuated by *Time*; But in the first *Kinde*, it is more *Diffused*, and more *Mastered* by the *Groffer Parts*, which the *Spirits* doe but digest: But in *Drinkes* the *Spirits* doe raigne, and finding lesse *Opposition* of the *Parts*, become themselves more *Strong*; Which causeth also more *Strength* in the *Liquor*; Such, as if the *Spirits* be of the *Hotter Sort*, the *Liquor* becommeth apt to *Burne*; But in *Time*, it causeth likewise, when the *Higher Spirits* are *Euapora- ted*, more *Sowrenesse*.

Experiment  
Solitary tou-  
ching *Blowes*  
and *Bruises*.

862

**I**T hath beene obserued by the *Ancients*, that *Plates* of *Metall*, and especially of *Brasse*, applied presently to a *Blow*, will keepe it downe from *Swelling*. The *Cause* is *Repercussion*, without *Humectation*, or *En- trance* of any *Body*: for the *Plate* hath only a *Virtuall Cold*, which doth not search into the *Hurt*; Whereas all *Plasters*, and *Ointments* do enter. Surely, the *Cause*, that *Blowes* and *Bruises* enduce *Swellings*, is, for that the *Spirits* resorting to Succour the *Part* that Laboureth, draw also the *Humours* with them: For we see, that it is not the *Repulse*, and the *Re- turne* of the *Humour* in the *Part Struken*, that causeth it; For that *Gouts*, and *Tooth-Aches* cause *Swelling*, where there is no *Percussion* at all.

Experiment  
Solitary, tou-  
ching the *Orris*  
*Root*.

863

**T**He *Nature* of the *Orris Root*, is almost *Singular*; For there bee few *Odoriferous Roots*; And in those that are, in any degree, *Sweet*, it is but the same *Sweetnesse* with the *Wood*, or *Leafe*: But the *Orris* is not *Sweet* in the *Leafe*; Neither is the *Flower* any thing so *Sweet* as the *Root*. The *Root* seemeth to haue a *Tender dainty Heat*; Which when it com- meth aboue *Ground*, to the *Sunne*, and the *Aire*, vanisheth: For it is a great *Mollifier*; And hath a *Smell* like a *Violet*.

Experiment  
Solitary tou-  
ching the Com-  
pression of Li-  
quors.

864

**I**T hath beene obserued by the *Ancients*, that a great *Vessell* full, drawne into *Bottles*; And then the *Liquor* put againe into the *Vessell*; will not fill the *Vessell* againe, so full as it was, but that it may take in more *Li- quor*: And that this holdeth more in *Wine*, than in *Water*. The *Cause* may be *Triuiall*; Namely, by the *Expence* of the *Liquor*, in regard some may sticke to the *Sides* of the *Bottles*: But there may be a *Cause* more *Subtill*; Which is, that the *Liquor* in the *Vessell*, is not so much *Com- pressed*, as in the *Bottle*; Because in the *Vessell*, the *Liquor* meeteth with *Liquor* chiefly; But in the *Bottles* a *Small Quantity* of *Liquor*, mee- teth



teth with the Sides of the Bottles, which Compresse it so, that it doth not Open againe.

**W**ater, being contiguous with Aire, Cooleteth it, but Moistneth it not, except it Vapour. The Cause is, for that Heat, and Cold haue a Virtuall Transition, without Communication of Substance; but Moisture not: And to all Madefaction there is required an Imbibition: But where the Bodies are of such seuerall Leuity, and Grauity, as they Mingle not, there can follow no Imbibition. And therefore, Oile likewise lyeth at the Top of the Water, without Commixture: And a Drop of Water, running swiftly ouer a Straw, or Smooth Body, wetteth not.

Experiment  
Solitary tou-  
ching the Wor-  
king of Water  
vpon Aire Con-  
tiguous.

865

**S**tar light Nights, yea and bright Moone-shine Nights, are Colder than Cloudy Nights. The Cause is, the Driness and Finenesse of the Aire, which thereby becommeth more Piercing, and Sharpe: And therefore Great Continents are colder than Islands: And as for the Moone, though it selfe inclineth the Aire to Moisture, yet when it shineth bright, it argueth the Aire is dry. Also Close Aire is warmer than Open Aire; which (it may be) is, for that the true Cause of Cold, is an Expiration from the Globe of the Earth, which in open Places is stronger; And againe, Aire it selfe, if it be not altered by that Expiration, is not without some Secret Degree of Heat: As it is not likewise without some Secret Degree of Light: For otherwise Cats, and Owles, could not see in the Night; But that Aire hath a little Light, Proportionable to the Visuall Spirits of those Creatures.

Experiment  
Solitary tou-  
ching the Na-  
ture of Aire.

866

**T**He Eyes doe moue one and the same way; For when one Eye moueth to the Nostrill, the other moueth from the Nostrill. The Cause is Motion of Consent, which in the Spirits, and Parts Spirituall, is Strong. But yet Use will induce the Contrary: For some can Squint, when they will: And the Common Tradition is, that if Children be set vpon a Table, with a Candle behind them, both Eyes will moue Outwards; As affecting to see the Light, and so induce Squinting.

Experiments  
in Consort  
touching the  
Eyes, and Sight.

867

Wee see more exquisitely with One Eye Shut, than with Both Open. The Cause is, for that the Spirits Visuall vnite themselues more, and so become Stronger. For you may see, by looking in a Glasse, that when you shut one Eye, the Pupill of the other Eye, that is Open, Dilateth.

868

The Eyes, if the Sight meet not in one Angle, See Things Double. The Cause is, for that Seeing two Things, and Seeing one Thing twice, worketh the same Effect: And therefore a little Pellet, held betweene two Fingers, laid a-crosse, seemeth Double.

869

Pore-blinde Men, see best in the Dimmer Lights; And likewise haue their Sight Stronger neere hand, than those that are not Pore-blind; And can Reade and Write smaller Letters. The Cause is, for that the Spirits Visuall, in those that are Pore-blinde, are Thinner, and Rarer, than in others; And therefore the Greater Light disperseth them. For the same

870



*Cause* they need Contracting; But being Contracted, are more strong, than the *Visuall Spirits* of Ordinary *Eyes* are; As when we see thorow a *Lenell*, the *Sight* is the Stronger: And so is it, when you gather the *Eye-lids* somewhat close: And it is commonly seene in those that are *Pore-blinde*, that they doe much gather the *Eye-lids* together. But *Old Men*, when they would see to Reade, put the Paper somewhat as farre off. The *Cause* is, for that *Old Mens Spirits Visuall*, contrary to those of *Pore-blinde Men*, vnite not, but when the *Object* is at some good distance, from their *Eyes*.

871

*Men* see better, when their *Eyes* are ouer-against the *Sunne*, or a *Candle*, if they put their *Hand* a little before their *Eye*. The *Reason* is, for that the *Glaring* of the *Sunne*, or the *Candle*, doth weaken the *Eye*; whereas the *Light Circumsused* is enough for the *Perception*. For we see, that an *Over-light* maketh the *Eyes* Dazell; In so much as Perpetuall Looking against the *Sunne*, would Cause *Blindnesse*. Againe, if *Men* come out of a *Great Light*, into a *Darke Roome*; And contrariwise, if they come out of a *Darke Roome*, into a *Light Roome*, they seeme to haue a *Mist* before their *Eyes*, and see worse, than they shall doe, after they haue stayed a little while, either in the *Light*, or in the *Darke*. The *Cause* is, for that the *Spirits Visuall*, are vpon a Sudden Change, disturbed, and put out of Order; And till they be recollected, doe not performe their Function well. For when they are much Dilated by *Light*, they cannot Contract suddenly; And when they are much Contracted by *Darknesse*, they cannot Dilate suddenly. And Excesse of both these (that is, of the *Dilatation*, and *Contraction* of the *Spirits Visuall*,) if it be long, Destroyeth the *Eye*. For as long Looking against the *Sun*, or *Fire*, hurteth the *Eye* by *Dilatation*; So *Curious Painting* in *Small Volumes*, and *Reading* of *Small Letters*, doe hurt the *Eye* by *Contraction*.

872

It hath bene obserued, that in *Anger*, the *Eyes* wax Red; And in *Blushing*, not the *Eyes*, but the *Eares*, and the *Parts* behinde them. The *Cause* is, for that in *Anger*, the *Spirits* ascend and wax Eager; Which is most easily seene in the *Eyes*, because they are Translucide; Though withall it maketh both the *Cheekes*, and the *Gills* Red; But in *Blushing*, it is true, the *Spirits* ascend likewise to Succour, both the *Eyes*, and the *Face*, which are the *Parts* that labour: But then they are repulsed by the *Eyes*, for that the *Eyes*, in *Shame* doe put backe the *Spirits*, that ascend to them, as vnwilling to looke abroad: For no *Man*, in that *Passion*, doth looke strongly, but Deiectedly; And that *Repulsion* from the *Eyes*, Diuorced the *Spirits* and *Heat* more to the *Eares*, and the *Parts* by them.

873

The *Objects* of the *Sight*, may cause a great *Pleasure* and *Delight* in the *Spirits*, but no *Paine*, or great *Offence*; Except it be by *Memory*, as hath bene said. The *Glimses* and *Beames* of *Diamonds* that strike the *Eye*; *Indian Feathers*, that haue glorious Colours; The *Comming* into a *Faire Garden*; The *Comming* into a *Faire Roome* richly furnished; A *Beautiful Person*; And the like; doe delight and exhilarate the *Spirits* much. The

Reason,



*Reason*, why it holdeth not in the *Offence*, is, for that the *Sight* is the most *Spiritual* of the *Senses*; whereby it hath no *Object* *Grosse* enough to offend it. But the *Cause* (chiefly) is, for that there be no *Active Objects* to offend the *Eye*. For *Harmonical Sounds*, and *Discordant Sounds*, are both *Active*, and *Positive*: So are *Sweet Smells*, and *Stinkes*: So are *Bitter*, and *Sweet*, in *Tastes*: So are *Over-Hot*, and *Over-Cold*, in *Touch*: But *Blacknesse*, and *Darknesse*, are indeed but *Privatives*; And therefore haue little or no *Actiuitie*. Somewhat they doe *Contristate*, but very little.

**W**ater of the *Sea*, or otherwise, looketh *Blacker* when it is moued, and *Whiter* when it resteth. The *Cause* is, for that by meanes of the *Motion*, the *Beames* of light passe not *Straight*, and therefore must be darkened: whereas, when it resteth, the *Beames* doe passe *Straight*. Besides, *Splendour* hath a *Degree* of *Whitenesse*; Especially if there be a little *Repercussion*: For a *Looking-Glasse* with the *Steele* behinde, looketh *Whiter*, than *Glasse Simple*. This *Experiment* deserueth to be driuen further, in *Trying* by what *Meanes Motion* may hinder *Sight*.

Experiment  
Solitary touching the  
Colour of the Sea,  
or other Water.

874

**S**hell-Fish haue beene, by some of the *Ancients*, compared and sorted with the *Insecta*; But I see no reason why they should; For they haue *Male*, and *Female*, as other *Fish* haue: Neither are they bred of *Putrefaction*; Especially such as doe *Moue*. Neuerthelesse it is certaine, that *Oysters*, and *Cockles*, and *Muscles*, which *Moue* not, haue no discriminate *Sex*: *Quare* in what time, and how they are bred? It seemeth that *Shells* of *Oysters* are bred where none were before; And it is tried, that the great *Horse-Muscle*, with the fine shell, that breedeth in *Ponds*, hath bred within thirty yeares: But then, which is strange, it hath beene tried, that they doe not only *Gape*, and *Shut*, as the *Oysters* doe, but *Remoue* from one *Place* to *Another*.

Experiment  
Solitary touching  
Shell-Fish.

875

**T**he *Senses* are alike *Strong*, both on the *Right Side*, and on the *Left*; But the *Limbes* on the *Right Side* are *Stronger*. The *Cause* may be, for that the *Braine*, which is the *Instrument* of *Sense*, is alike on both *Sides*; But *Motion*, and *Habillities* of *Mouing*, are somewhat holpen from the *Liver*, which lieth on the *Right Side*. It may be also, for that the *Senses* are put in *Exercise*, indifferently, on both *Sides*, from the *Time* of our *Birch*; But the *Limbes* are vsed most on the *Right Side*, whereby *Custom* helpeth; For we see that some are *Left-Handed*: Which are such, as haue vsed the *Left-Hand* most.

Experiment  
Solitary touching the  
Right Side, and the  
Left.

876

**F**riccions make the *Parts* more *Fleshie*, and *Full*: As wee see both in *Men*; And in *Currying* of *Horses*, &c. The *Cause* is, for that they draw greater *Quantitie* of *Spirits* and *Bloud* to the *Parts*: And againe, because they draw the *Aliment* more forcibly from within: And againe, because they relax the *Pores*, and so make better *Passage* for the *Spirits*, *Bloud*, and *Aliment*: Lastly, because they dissipate and digest any *Inutile* or *Excrementitious*

Experiment  
Solitary touching  
Friccions.

877



*crementitious Moisture*, which lieth in the *Flesh*: All which helpe *Assimilation*. *Frictions* also doe more *Fill*, and *Impinguate* the *Body*, than *Exercise*. The *Cause* is, for that in *Frictions*, the *Inward Parts* are at rest; Which in *Exercise* are beaten (many times) too much: And for the same Reason, (as we haue noted heretofore) *Gally-Slaves* are *Fat* and *Fleshy*, because they stirre the *Limmes* more, and the *Inward Parts* lesse.

Experiment  
Solitary tou-  
ching Globes  
appearing Flat  
at Distance.

878

**A**LL Globes as farre off appeare *Flat*. The *Cause* is, for that *Distance* being a *Secondary Object of Sight*, is not otherwise discerned, than by more or lesse *Light*; which *Disparity* when it cannot be discerned, all seemeth *One*: As it is (generally) in *Objects* not distinctly discerned; For so *Letters*, if they be so farre off, as they cannot be discerned, shew but as a *Dusky Paper*: And all *Engravings* and *Embossings*, (as farre off) appeare *Plaine*.

Experiment  
Solitary tou-  
ching Shadows

879

**T**He *Vtmost Parts* of *Shadows* seeme euer to *Tremble*. The *Cause* is, for that the little *Moats*, which we see in the *Sunne*, doe euer Stirre, though there be no *Wind*; And therefore those Mouing, in the Meeting of the *Light* and the *Shadow*, from the *Light* to the *Shadow*, and from the *Shadow* to the *Light*, doe shew the *Shadow* to Moue, because the *Medium* Moueth.

Experiment  
Solitary tou-  
ching the Row-  
ling and Brea-  
king of the Seas.

880

**S**Hallow, and *Narrow Seas*, breake more than *Deepe*, and *Large*. The *Cause* is, for that the *Impulsion* being the same in Both; Where there is greater *Quantity* of *Water*, and likewise *Space* Enough; there the *Water* Rowleth and Moueth, both more Slowly, and with a Sloper Rise, and Fall: But where there is lesse *Water*, and lesse *Space*, and the *Water* dasheth more against the *Bottom*; there it moueth more Swiftly, and more in *Precipice*; For in the *breaking* of the *Wanes* there is euer a *Precipice*.

Experiment  
Solitary tou-  
ching the Dul-  
coration of Salt-  
Water.

881

**I**T hath beene obserued by the *Ancients*, that *Salt Water* Boyled, or Boyled and Cooled againe, is more *Potable*, than of it selfe *Raw*: And yet the *Taste* of *Salt*, in *Distillations* by *Fire*, riseth not; For the *Distilled Water* will be *Fresh*. The *Cause* may be, for that the *Salt Part* of the *Water*, doth partly rise into a Kind of *Scumme* on the *Top*; And partly goeth into a *Sediment* in the *Bottom*: And so is rather a *Separation*, than an *Evaporation*. But it is too grosse to rise into a *Vapour*: And so is a *Bitter Taste* likewise; For Simple *Distilled Waters*, of *Wormewood*, and the like, are not Bitter.

Experiment  
Solitary tou-  
ching the Re-  
turne of Salt-  
nesse in Pits vp-  
on the Sea-  
Shore.

882

**I**T hath beene set downe before, that *Pits* vpon the *Sea-Shore*, turne into *Fresh Water*, by *Percolation* of the *Salt* through the *Sand*: But is is further noted, by some of the *Ancients*, that in some Places of *Affricke*, after a time, the *Water* in such *Pits* will become *Brackish* againe. The *Cause* is, for that after a time, the very *Sands*, thorow which the *Salt-Water* passeth, become *Salt*; And so the *Strainer* it selfe is tinged with *Salt*.



**Sale.** The Remedy therefore is, to digge still *New Pits*, when the old wax *Brackish*; As if you would change your *Strainer*.

**I**T hath beene observed by the *Ancients*, that *Salt-Water*, will dissolue *Salt* put into it, in lesse time, than *Fresh Water* will dissolue it. The *Cause* may be, for that the *Salt* in the *Precedent Water*, doth, by *Similitude of Substance*, draw the *Salt* new put in, vnto it; Whereby it diffuseth in the *Liquor* more speedily. This is a *Noble Experiment*, if it be true; For it sheweth *Meanes* of more *Quicke* and *Easie Infusions*; And it is likewise a good *Instance of Attraction*, by *Similitude of Substance*. Try it with *Sugar* put into *Water*, formerly *Sugred*; And into other *Water Vnsugred*.

Experiment  
Solitary tou-  
ching *Attraction*  
by *Similitude*  
of *Substance*.

883

**P**Ut *Sugar* into *Wine*, part of it aboue, part vnder the *Wine*; And you shall finde, (that which may seeme strange,) that the *Sugar* aboue the *Wine*, will soften and dissolue sooner, than that within the *Wine*. The *Cause* is, for that the *Wine* entreth that *Part* of the *Sugar*, which is vnder the *Wine*, by *Simple Infusion*, or *Spreading*; But that *Part* aboue the *Wine* is likewise forced by *Sucking*: For all *Spungie Bodies* expell the *Aire*, and draw in *Liquor*, if it be *Contiguous*: As we see it also in *Sponges*, put part about the *Water*. It is worthy the *Inquiry*, to see how you may make more *Acturate Infusions*, by *Helpe of Attraction*.

Experiment  
Solitary tou-  
ching *Attraction*.

884

**W**ATER in *Wells* is warmer in *Winter*, than in *Summer*: And so *Aire* in *Caves*. The *Cause* is, for that in the *Hither Parts*, vnder the *Earth*, there is a *Degree* of some *Heat*; (As appeareth in *Sulphureous Veines*, &c.) Which shut close in, (as in *Winter*) is the *More*; But if it *Perspire*, (as it doth in *Summer*,) it is the *Lesse*.

Experiment  
Solitary tou-  
ching *Heat* vnder *Earth*.

885

**I**T is reported, that amongst the *Leucadians*, in *Ancient* time, vpon a *Superstition*, they did vse to *Precipitate* a *Man*, from a *High Cliffe* into the *Sea*; Tying about him, with *Strings*, at some distance, many great *Fowles*; And fixing vnto his *Body* diuers *Feathers*, spred, to breake the *Fall*. Certainly many *Birds* of good *Wing*, (As *Kites*, and the like) would beare vp a good *Weight* as they flie; And *Spreading of Feathers*, thin and close, and in great *Bredth*, will likewise beare vp a great *Weight*; Being euen laid, without *Tilting* vpon the *Sides*. The further *Extension* of this *Experiment* for *Flying* may be thought vpon.

Experiment  
Solitary tou-  
ching *Flying* in  
the *Aire*.

886

**T**HERE is, in some *Places*, (namely in *Cephalonia*,) a little *Shrub*, which they call *Holy-Oake*, or *Dwarfe-Oake*: Vpon the *Leaves* whereof there riseth a *Tumour*, like a *Blister*; Which they gather, and rub out of it, a certaine *Red Dust*, that conuerteth (after a while) into *Wormes*, which they kill with *Wine*, (as is reported,) when they beginne to *Quicknen*: With this *Dust* they die *Scarlet*.

Experiment  
Solitary tou-  
ching the *Dye*  
of *Scarlet*.

887

**I**N *Zant*, it is very ordinary, to make *Men Impotent*, to accompany

Experiment  
Solitary tou-

with



ching Malef-  
ciating.

888

Experiment  
Solitary tou-  
ching the Rise  
of Water, by  
Meanes of  
Flame.

889

Experiment  
Solitary tou-  
ching Water  
Rising.

888

Experiment  
Solitary tou-  
ching Water  
Rising.

888

Experiments  
in Consort,  
touching the  
Influences of  
the Moone.Experiment  
Solitary tou-  
ching the De-  
scending.

887

Experiment  
Solitary tou-  
ching Water  
Rising.

with their *Wines*. The like is Practised in *Gasconie*; Where it is called *Nouer l'eguillette*. It is practised alwaies vpon the *Wedding Day*. And in *Zant*, the Mothers themselves doe it, by way of Preuention; Because thereby they hinder other *Charmes*, and can vndoe their Owne. It is a Thing the *Cinill Law* taketh knowledge of; And therefore is of no Light Regard.

IT is a Common Experiment, but the Cause is mistaken. Take a *Pot*, (Or better a *Glasfe*, because therein you may see the Motion,) And set a *Candle* lighted in the *Bottom* of a *Basen* of *Water*; And turne the *Mouth* of the *Pot*, or *Glasfe*, ouer the *Candle*, and it will make the *Water* rise. They ascribe it, to the *Drawing* of *Heat*; Which is not true: For it appeareth plainly to be but a *Motion* of *Nexe*, which they call *Ne detur vacuum*; And it proceedeth thus. The *Flame* of the *Candle*, as soone as it is coue- red, being suffocated by the *Close Aire*, lesseneth by little and little: Du- ring which time, there is some little *Ascent* of *Water*, but not much: For the *Flame* Occupying lesse and lesse *Roome*, as it lesseneth, the *Water* succeedeth. But vpon the *Instant* of the *Candles Going out*, there is a sud- den *Rise*, of a great deale of *Water*; For that the *Body* of the *Flame* filleth no more *Place*; And so the *Aire*, and the *Water* succeed. It worketh the same *Effect*, if in stead of *Water*, you put *Flower*, or *Sand*, into the *Basen*: Which sheweth, that it is not the *Flames* drawing the *Liquour*, as *Non- rishment*; As it is supposed; For all *Bodies* are alike vnto it; As it is euert in *Motion* of *Nexe*; Insomuch as I haue scene the *Glasfe*, being held by the *Hand*, hath lifted vp the *Basen*, and all: The *Motion* of *Nexe*, did so Clasp the *Bottom* of the *Basen*. That Experiment, when the *Basen* was lifted vp, was made with *Oile*, and not with *Water*: Neuerthelesse this is true, that at the very first *Setting* of the *Mouth* of the *Glasfe*, vpon the *Bot- tome* of the *Basen*, it draweth vp the *Water* a little, and then standeth at a *Stay*, almost till the *Candles Going out*, as was said. This may shew some *Attraction* at first: But of this we will speake more, when we handle *At- tractions* by *Heat*.

Of the Power of the *Celestiall Bodies*, and what more Se- cret *Influences* they haue, besides the two Manifest *Influences* of *Heat*, and *Light*, We shall speake, when we handle Experi- ments touching the *Celestiall Bodies*: Meane-while, wee will giue some *Directions* for more certaine *Trials*, of the *Vertue* and *Influences* of the *Moone*; which is our *Neerest Neigh- bour*.

The *Influences* of the *Moone*, (most obserued,) are *Foure*. The *Drawing forth* of *Heat*: The *Inducing* of *Putrefaction*: The *Increase* of *Moisture*: The *Exciting* of the *Motions* of *Spirits*.

For



For the *Drawing forth* of *Heat*, we haue formerly prescribed, to take *Water Warne*, and to set Part of it against the *Moone-Beames*, and Part of it with a *Skreen* betweene; And to see whether that which standeth Exposed to the *Beames*, will not *Cool* sooner. But because this is but a *Small interposition*, (though in the *Sun* we see a *Small Shade* doth much,) it were good to trie it, when the *Moone* shineth, and when the *Moone* shineth not at all; And with *Water Warne* in a *Glasse-Bottle*, as well as in a *Dish*; And with *Cinders*; And with *Iron Red-Hot*; &c.

890

For the *Inducing* of *Putrefaction*, it were good to trie it with *Flesh*, or *Fish*, Exposed to the *Moone-Beames*; And againe Exposed to the *Aire*, when the *Moone* shineth not, for the like time; To see whether will corrupt sooner: And trie it also with *Capon*, or some other *Fowle*, laid abroad, to see whether it will mortifie, and become tender sooner? Trie it also with *Dead Flies*, or *Dead Wormes*, hauing a little *Water* cast vpon them, to see whether will *Putrifie* sooner. Trie it also with an *Apple*, or *Orange*, hauing *Holes* made in their *Tops*, to see whether will Rot or Mould sooner? Try it also with *Holland-Cheese*, hauing *Wine* put into it, whether will breed *Mites* sooner, or greater?

891

For the *Increase* of *Moisture*, the Opinion Receiued is; That *Seeds* will grow soonest; And *Haire*, and *Nails*, and *Hedges*, and *Herbs*, Cut, &c. will grow soonest, if they be Set, or Cut, in the *Increase* of the *Moone*. Also that *Braines* in *Rabbits*, *Wood-cockes*, *Calues*, &c. are fullest in the *Full* of the *Moone*: And so of *Marrow* in the *Bones*: And so of *Oysters*, and *Cockles*, which of all the rest are the easiest tried, if you haue them in *Pits*.

892

Take some *Seeds*, or *Roots*, (as *Onions*, &c.) and set some of them immediately after the *Change*; And others of the same kinde immediately after the *Full*. Let them be as Like as can be: The *Earth* also the Same as neare as may be; And therefore best in *Pots*: Let the *Pots* also stand, where no *Raine*, or *Sunne* may come to them, lest the *Difference* of the *Weather* confound the *Experiment*: And then see in what *Time*, the *Seeds* Set in the *Increase* of the *Moone*, come to a certaine Height; And how they differ from those that are Set in the *Decrease* of the *Moone*.

893

It is like, that the *Brain* of *Man* waxeth *Moister*, and *Fuller*, vpon the *Full* of the *Moone*: And therefore it were good for those that haue *Moist Braines*, and are great *Drinkers*, to take *Fume* of *Lignum Aloës*, *Rose-Mary*, *Frankincense*, &c. about the full of the *Moone*. It is like also, that the *Humours* in *Mens Bodies*, Increase, and Decrease, as the *Moone* doth; And therefore it were good to *Purge*, some day, or two, after the *Full*; For that then the *Humours* will not replenish so soone againe.

894

As for the *Exciting* of the *Motion* of the *Spirits*, you must note that the *Growth* of *Hedges*, *Herbs*, *Haire*, &c. is caused from the *Moone*, by *Exciting* of the *Spirits*, as well as by *Increase* of the *Moisture*. But for *Spirits* in particular, the great *Instance* is in *Lunatics*.

895

There may be other *Secret Effects* of the *Influence* of the *Moone*, which are not yet brought into *Observation*. It may be, that if it so fall

896

out,



out, that the *Wind* be *North*, or *North-East*, in the *Fall* of the *Moone*, it increaseth *Cold*; And if *South*, or *South-West*, it disposeth the *Aire*, for a good while, to *Warmth*, and *Raine*; Which would be obserued.

897

It may be, that *Children*, and *Young Cattell*, that are *Brought forth* in the *Fall* of the *Moone*, are stronger, and larger, than those that are brought forth in the *Wane*: And those also which are *Begotten* in the *Fall* of the *Moone*: So that it might be good *Husbandry*, to put *Rams*, and *Bulls* to their *Females*, somewhat before the *Fall* of the *Moone*. It may be also, that the *Egges* lay'd in the *Fall* of the *Moone*, breed the better *Bird*: And a Number of the like *Effects*, which may be brought into *Observation*: *Quare* also, whether great *Thunders*, and *Earth-Quakes*, be not most in the *Fall* of the *Moone*?

Experiment  
Solitary tou-  
ching *Vinegar*.

898

**T**He *Turning* of *Wine* to *Vinegar*, is a *Kind* of *Putrefaction*: And in *Making* of *Vinegar*, they vse to set *Vessels* of *Wine* ouer against the *Noone-Sunne*; which calleth out the more *Oily Spirits*, and leaueth the *Liquour* more *Soure*, and *Hard*. We see also, that *Burnt-Wine* is more *Hard*, and *Astringent*, than *Wine Vnburnt*. It is said, that *Cider* in *Nauigations* vnder the *Line* ripeneth, when *Wine* or *Beere* soureth. It were good to set a *Rundlet* of *Veriuyce* ouer against the *Sunne*, in *Summer*, as they doe *Vinegar*, to see whether it will *Ripen*, and *Sweeten*.

Experiment  
Solitary tou-  
ching *Creatures*  
that *Sleepe* all  
*Winter*.

899

**T**Here be diuers *Creatures*, that *Sleepe* all *Winter*; As the *Beare*, the *Hedge-hogge*, the *Bat*, the *Bee*, &c. These all wax *Fat* when they *Sleepe*, and egest not. The *Cause* of their *Fattening*, during their *Sleeping time*, may be the *Want* of *Assimilating*; For whatsoever *Assimilates* not to *Flesh*, turneth either to *Sweat*, or *Fat*. These *Creatures*, for part of their *Sleeping Time*, haue beene obserued not to *Stirre* at all; And for the other part, to *Stirre*, but not to *Remoue*. And they get *Warme* and *Close Places* to *Sleepe* in. When the *Flemmings* Wintred in *Noua Zembla*, the *Bears*, about the *Middle* of *November*, went to *Sleepe*; And then the *Foxes* began to come forth, which durst not before. It is noted by some of the *Ancients*, that the *Shee-Beare* breedeth, and lyeth in with her *Young*, during that time of *Rest*: And that a *Beare*, *Bigge* with *Young*, hath seldome beene seene.

Experiment  
Solitary tou-  
ching the *Ge-  
nerating* of  
*Creatures* by *Co-  
pulation*, and by  
*Putrefaction*.

900

**S**OME *Living Creatures* are *Procreated* by *Copulation* betweene *Male*, and *Female*: Some by *Putrefaction*; And of those which come by *Putrefaction*, many doe (neverthelesse) afterwards *procreate* by *Copulation*: For the *Cause* of both *Generations*: First, it is most certaine, that the *Cause* of all *Vinification*, is a *Gentle* and *Proportionable Heat*, working vpon a *Glutinous* and *Yeelding Substance*: For the *Heat* doth bring forth *Spirit* in that *Substance*: And the *Substance*, being *Glutinous*, produceth Two *Effects*: The One, that the *Spirit* is *Detained*, and cannot *Breake forth*: The Other, that the *Matter* being *Gentle*, and *Yeelding*, is driven forwards by the *Motion* of the *Spirits*, after some *Swelling* into *Shape*, and *Members*.

There-



Therefore all *Sperme*, all *Menstruous Substance*, all *Matter* whereof *Creatures* are produced by *Putrefaction*, haue euermore a *Clofenesse*, *Lentour*, and *Sequasity*. It seemeth therefore, that the *Generation* by *Sperme only*, and by *Putrefaction*, haue two Different *Causes*. The First is, for that *Creatures*, which haue a *Definite* and *Exact Shape*, (as those haue which are Procreated by *Copulation*;) cannot be produced by a *Weake*, and *Casual Heat*; Nor out of *Matter*, which is not *exactly Prepared*, according to the *Species*. The Second is, for that there is a greater *Time* required for *Maturation* of *Perfect Creatures*; For if the *Time* required in *Viuisification* be of any length, then the *Spirit* will *Exhale*, before the *Creature* be *Mature*: Except it be *Enclosed* in a *Place* where it may haue *Continuance* of the *Heat*, *Accesse* of some *Nourishment* to maintaine it, and *Clofenesse* that may keepe it from *Exhaling*. And such *Places* are the *Wombes*, and *Matrices*, of the *Females*. And therefore all *Creatures*, made of *Putrefaction*, are of more *Vncertaine Shape*; And are made in *Shorter Time*; And need not so *Perfect an Enclosure*, though some *Clofenesse* be commonly required. As for the *Heathen Opinion*, which was, that vpon great *Mutations* of the *World*, *Perfect Creatures* were first Engendred of *Concretion*; As well as *Frogs*, and *Wormes*, and *Flies*, and such like, are now; Vve know it to be vaine: But if any such

Thing should bee admitted, Discourfing according to *Sense*, it cannot be, except you admit a *Chaos* first, and *Commixture* of *Heauen*, and *Earth*: For the *Frame* of the *World*, once in *Order*, cannot effect it by any *Excesse*, or *Casualtie*.

NATV.



The first of these is the fact that the  
the second is the fact that the  
the third is the fact that the  
the fourth is the fact that the  
the fifth is the fact that the  
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# NATVRALL HISTORIE.

## X. Century.



**T**He Philosophie of Pythagoras, ( which was full of Superstition, ) did first plant a *Monstrous Imagination*; Which afterwards was, by the Schoole of Plato, and Others, Watred and Nourished. It was, that the *World* was *One Entire, Perfect, Liuing Creature*; In so much as *Apollonius of Tyana*, a *Pythagorean Prophet*, affirmed, that the *Ebbing and Flowing* of the *Sea*, was the *Respiration* of the *World*, drawing in *Water* as *Breath*, and putting it forth againe. They went on, and inferred; That if the *World* were a *Liuing Creature*, it had a *Soule*, and *Spirit*; Which also they held, calling it *Spiritus Mundi*; The *Spirit* or *Soule* of the *World*; By which they did not intend *God*; (for they did admit of a *Deitie* besides,) But only

Experiments  
in Consort,  
touching the  
*Transmission*,  
and *Influx* of  
*Immaterial*  
*Virtues*, and the  
*Force* of *Imagi-*  
*nation*.



only the Soule, or Essentiall Forme of the Vniuerse. This Foundation being laid, they mought build vpon it, what they would; For in a *Living Creature*, though neuer so great, (As for Example, in a great *Whale*,) the *Sense*, and the *Affects* of any one Part of the *Body*, instantly make a *Transcursion* thorowout the whole *Body*: So that by this they did insinuate, that no *Distance* of *Place*, nor *Want* or *Indisposition* of *Matter*, could hinder *Magickall Operations*; But that, (for Example,) we mought here in *Europe*, haue *Sense* and *Feeling* of that, which was done in *China*: And likewise, we mought worke any *Effect*, without, and against *Matter*: And this, not Holpen by the *Cooperation* of *Angells*, or *Spirits*, but only by the *Vnity* and *Harmony* of *Nature*. There were some also, that staid not here; but went further, and held; That if the *Spirit* of *Man*, (whom they call the *Microcosme*,) doe giue a fit touch to the *Spirit* of the *World*, by strong *Imaginations*, and *Beleefes*, it might command *Nature*; For *Paracelsus*, and some darksome *Authors* of *Magick*, doe ascribe to *Imagination Exalted*, the *Power* of *Miracle-working Faith*. With these Vast and Bottomlesse *Follies*, *Men* haue beene (in part) entertained.

But we, that hold firme to the *Workes* of *God*; And to the *Sense*, which is *Gods Lampe*; (*Lucerna Dei Spiraculum Hominis*;) will enquire with all Sobrietie, and Seueritie, whether there be to be found, in the *Foot-steps* of *Nature*, any such *Transmission* and *Influx* of *Immateriate Vertues*; And what the *Force* of *Imagination* is; Either vpon the *Body Imaginant*, or vpon another *Body*: Wherein it will be like that *Labour* of *Hercules*, in *Purging* the *Stable* of *Augeas*, to separate from *Superstitious*, and *Magickall Arts*, and *Observations*, any thing that is cleane, and pure *Naturall*; And not to be either *Contemned*, or *Condemned*. And although wee shall haue occasion to speake of this in more *Places* than *One*, yet wee will now make some *Entrance* therein.

**M**en are to be Admonished, that they doe not withdraw *Credit*, from the *Operations* by *Transmission* of *Spirits*, and *Force* of *Imagination*, because the *Effects* faile sometimes. For as in *Infection*, and *Contagion* from *Body* to *Body*, (as the *Plague*, and the like,) it is most certaine, that

Experiments  
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the *Infection* is received (many times) by the *Body Passive*, but yet is by the *Strength*, and good *Disposition* thereof, Repulsed, and wrought out, before it be formed into a *Disease*; So much more in *Impressions* from *Minde to Minde*, or from *Spirit to Spirit*, the *Impression* taketh, but is Encountred, and Overcome, by the *Minde* and *Spirit*, which is *Passive* before it worke any manifest *Effect*. And therefore, they worke most vpon *Weake Mindes*, and *Spirits*: As those of *Women*; *Sicke Persons*; *Superstitious*, and *Fearefull Persons*; *Children*, and *Young Creatures*.

*Nescio quis teneros Oculis mihi fascinat Agnos:*

The *Poet* speaketh not of *Sheepe*, but of *Lambs*. As for the *Weaknesse* of the *Power* of them, vpon *Kings*, and *Magistrates*; It may be ascribed (besides the maine, which is the *Protection* of *God*, ouer those that Execute his Place) to the *Weaknesse* of the *Imagination* of the *Imaginant*: For it is hard, for a *Witch*, or a *Sorcerer*, to put on a *Beleeve*, that they can hurt such *Persons*.

*Men* are to be Admonished, on the other side, that they doe not easily giue Place and Credit to these *Operations*, because they *Succeed many times*; For the *Cause* of this *Succeffe*, is (oft) to be truly ascribed, vnto the *Force* of *Affection* and *Imagination*, vpon the *Body Agent*; And then by a *Secondary Meanes*, it may worke vpon a *Diners Body*: As for Example; If a *Man* carry a *Planets Seale*, or a *Ring*, or some *Part* of a *Beast*, beleeuing strongly, that it will helpe him to obtaine his *Loue*; Or to keep him from danger of hurt in *Fight*; Or to preuaile in a *Suit*; &c. it may make him more *Active*, and *Industrious*; And againe, more *Confident*, and *Persisting*, than otherwise he would be. Now the great *Effects* that may come of *Industry*, and *Persuerance*, (especially in *Ciuill Businesse*;) who knoweth not? For wee see *Audacitie* doth almost binde and mate the weaker Sort of *Minds*; And the *State* of *Humane Actions* is so variable, that to try Things oft, and neuer to giue ouer, doth *Wonders*: Therefore, it were a *Meere Fallacie* and *Mistaking*, to ascribe that to the *Force* of *Imagination*, vpon another *Body*, which is but the *Force* of *Imagination* vpon the *Proper Body*: For there is no doubt, but that *Imagination*, and *Vehement Affection*, worke greatly vpon the *Body* of the *Imaginant*: As we shall shew in due place.

*Men* are to be Admonished, that as they are not to mistake the *Causes* of these *Operations*; So, much lesse, they are to mistake the *Fact*, or *Effect*; And rashly to take that for done, which is not done. And therefore, as diuers wise *Judges* haue prescribed, and cautioned, *Men* may not too rashly beleeue, the *Confessions* of *Witches*, nor yet the *Evidence* against them. For the *Witches* themselves are *Imaginative*, and beleeue oft-times, they doe that, which they doe not: And *People* are *Credulous* in that point, and ready to impute *Accidents*, and *Naturall Operations*, to *Witch-craft*. It is worthy the Obseruing, that both in *Ancient*, and *Late times*; (As in the *Thessalian Witches*, and the *Meetings of Witches* that haue beene recorded by so many late *Confessions*;) the great *Wonders* which they tell, of *Carrying* in the *Aire*; *Transforming* themselves into



other Bodies; &c. are still reported to be wrought, not by *Incantations*, or *Ceremonies*; But by *Ointments*, and *Anointing* themselves all over. This may iustly moue a *Man* to think, that these *Fables* are the *Effects* of *Imagination*: For it is certaine, that *Ointments* doe all, (if they be laid on any thing thicke) by *Stopping* of the *Pores*, shut in the *Vapours*, and send them to the *Head* extremely. And for the Particular *Ingredients* of those *Magickall Ointments*, it is like they are *Opiate* and *Soporiferous*. For *Anointing* of the *Fore-Head*, *Necke*, *Feet*, *Back-Bone*, we know is vsed for *Procuring Dead Sleepes*: And if any *Man* say, that this *Effect* would be better done by *Inward Potions*; Answer may bee made, that the *Medicines*, which go to the *Ointments*, are so strong, that if they were vsed *Inwards*, they would kill those that vse them: And therefore they worke *Potently*, though *Outwards*.

Wee will diuide the *Seuerall Kindes* of the *Operations*, by *Transmission* of *Spirits*, and *Imagination*; Which will giue no small *Light* to the *Experiments* that follow. All *Operations* by *Transmission* of *Spirits*, and *Imagination* haue this; That they *Worke at Distance*, and not at *Touch*; And they are these being distinguished.

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The First is the *Transmission* or *Emission*, of the *Thinner*, and more *Airie Parts* of *Bodies*; As in *Odours*, and *Infections*; And this is, of all the rest, the most *Corporeall*. But you must remember withall, that there be a *Number* of those *Emissions*, both *Wholsome*, and *Unwholsome*, that giue no *Smell* at all: For the *Plague*, many times, when it is taken, giueth no *Scent* at all: And there be many *Good* and *Healthfull Aires*, that doe appeare by *Habitation*, and other *Proofes*, that differ not in *Smell* from other *Aires*. And vnder this *Head*, you may place all *Imbibitions* of *Aire*, where the *Substance* is *Materiall*, *Odour-like*; Whereof some neuertheless are strange, and very suddenly diffused; As the *Alteration*, which the *Aire* receiueth in *Egypt*, almost immediatly, vpon the *Rising* of the *Riuer* of *Nilus*, whereof we haue spoken.

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The Second is the *Transmission* or *Emission* of those *Things* that we call *Spiritual Species*; As *Visibles*, and *Sounds*: The one whereof wee haue handled; And the other we shall handle in due place. These moue swiftly, and at great distance; But then they require a *Medium* well disposed, And their *Transmission* is easily stopped.

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The Third is the *Emissions*, which cause *Attraction* of *Certaine Bodies* at *Distance*; Wherein though the *Loadstone* be commonly placed in the *First Ranke*, yet we thinke good to except it, and referre it to another *Head*: But the *Drawing* of *Amber*, and *Iet*, and other *Electricke Bodies*; And the *Attraction* in *Gold* of the *Spirit* of *Quick-Silver*, at distance; And the *Attraction* of *Heat* at distance; And that of *Fire* to *Naphtha*; And that of some *Herbs* to *Water*, though at distance; And diuers others; We shall handle, but yet not vnder this present *Title*, but vnder the *Title* of *Attraction* in generall.

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The Fourth is the *Emission* of *Spirits*, and *Immaterial Powers* and *Vertues*, in those Things, which worke by the *Vniuersall Configuration*, and *Sympathy* of the *World*; Not by *Formes*, or *Celestiall Influxes*, (as is vainly taught and receiued,) but by the *Primitive Nature* of *Matter*, and the *Seeds of Things*. Of this kinde is, (as we yet suppose,) the *Working* of the *Load-Stone*, which is by *Consent* with the *Globe* of the *Earth*: Of this Kinde is the *Motion* of *Gravity*, which is by *Consent* of *Dense Bodies*, with the *Globe* of the *Earth*: Of this kinde is some *Disposition* of *Bodies* to *Rotation*, and particularly from *East* to *West*: Of which kinde we conceiue the *Maine Float* and *Re-float* of the *Seas*, which is by *Consent* of the *Vniuerse*, as Part of the *Diurnall Motion*. These *Immaterial Vertues* haue this Property differing from Others; That the *Diversity* of the *Medium* hindreth them not; But they passe through all *Mediums*, yet at *Determinate distances*. And of these we shall speake, as they are incident to seuerall *Titles*.

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The Fifth is the *Emissions* of *Spirits*; And this is the Principall in our Intention to handle now in this Place: Namely, the *Operation* of the *Spirits* of the *Minde* of *Man*, vpon other *Spirits*: And this is of a *Double Nature*: The *Operations* of the *Affections*, if they be *Vehement*; And the *Operation* of the *Imagination*, if it be *Strong*. But these two are so *Compled*, as we shall handle them together: For when an *Enuious*, or *Amorous Affect*, doth infect the *Spirits* of Another, there is Ioynd both *Affect*, and *Imagination*.

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The Sixth is, the *Influxes* of the *Heavenly Bodies*, besides those two Manifest Ones, of *Heat*, and *Light*. But these we will handle, where we handle the *Celestiall Bodies*, and *Motions*.

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The Seuenth is the *Operations* of *Sympathy*; Which the *Writers* of *Naturall Magicke* haue brought into an *Art* or *Precept*: And it is this; That if you desire to Super-induce, any *Vertue* or *Disposition*, vpon a *Person*, you should take the *Living Creature*, in which that *Vertue* is most *Eminent*, and in *Perfection*: Of that *Creature* you must take the *Parts*, wherein that *Vertue* chiefly is *Collocate*: Againe, you must take those *Parts*, in the *Time*, and *Act*, when that *Vertue* is most in *Exercise*; And then you must apply it to that *Part* of *Man*, wherein that *Vertue* chiefly *Consisteth*. As if you would Super-induce *Courage* and *Fortitude*, take a *Lion*, or a *Cock*; And take the *Heart*, *Tooth*, or *Paw* of the *Lion*; Or the *Heart*, or *Spurre* of the *Cock*: Take those *Parts* immediatly after the *Lion*, or the *Cock* haue bene in *Fight*; And let them be worne, vpon a *Mans Heart*, or *Wrest*. Of these and such like *Sympathies*, we shall speake vnder this present *Title*.

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The Eighth and last is, an *Emission* of *Immaterial Vertues*; Such as we are a little doubtfull to Propound; It is so prodigious: But that it is so constantly auouched by many: And we haue set it downe, as a *Law* to our Selues, to examine things to the Bottom; And not to receiue vpon Credit, or reiect vpon *Improbabilities*, vntill there hath passed a due Examination. This is, the *Sympathy* of *Individuals*: For as

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Experiments  
in Confort  
touching Emif-  
sion of Spirits  
in Vapour, or  
Exhalation, O-  
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there is a *Sympathy* of *Species*; So (it may be) there is a *Sympathy* of *Indi-  
viduals*: That is, that in *Things*, or the *Parts* of *Things*, that haue beene  
once *Contiguous*, or *Entire*, there should remaine a *Transmission* of *Vertue*,  
from the One to the Other: As betweene the *Weapon* and the *Wound*.  
Whereupon is blazed abroad the *Operation* of *Vnguentum Teli*: And so  
of a *Peece* of *Lard*, or *Sticke* of *Elder*, &c. that if *Part* of it be Consumed  
or Putrified, it will worke vpon the other *Part* Seuered. Now wee will  
pursue the *Instances* themselves.

**T**He *Plague* is many times taken, without *Manifest Sense*, as hath bin  
said. And they report, that where it is found, it hath a Sent, of the  
*Smell* of a *Mellow Apple*; And (as some say) of *May-Flowers*: And it is  
also receiued, that *Smells* of *Flowers*, that are *Mellow* and *Lushious*, are ill  
for the *Plague*; As *White Lillies*, *Cowslips*, and *Hyacinths*.

The *Plague* is not easily receiued by such, as continually are about  
them, that haue the *Plague*; As *Keepers* of the *Sicke*, and *Physitians*; Nor  
again by such as take *Antidotes*, either Inward, (as *Mithridate*; *Juniper-  
Berries*; *Rue*, *Leafe* and *Seed*; &c.) Or outward, (as *Angelica*, *Zedoary*,  
and the like, in the Mouth; *Terre*, *Galbanum*, and the like, in Perfume;) Nor  
again by *Old People*, and such as are of a *Dry* and *Cold Complexion*.  
On the other side, the *Plague* taketh soonest hold of those, that come  
out of a *Fresh Aire*; And of those that are *Fasting*; And of *Children*; And  
it is likewise noted to goe in a *Blond*, more than to a *Stranger*.

**N**OW The most Pernicious *Infection*, next the *Plague*, is the *Smell* of the  
*Jaile*; When *Prisoners* haue beene Long, and Close, and Nastily kept;  
Whereof we haue had, in our time, Experience, twice or thrice; when  
both the *Judges* that sate vpon the *Jaile*, and Numbers of those that at-  
tended the *Businesse*, or were present, Sickned vpon it, and Died. There-  
fore it were good wisdom, that in such Cases, the *Jaile* were Aired, be-  
fore they be brought forth.

**O**ut of question, if such *Foule Smells* bee made by *Art*, and by the  
*Hand*, they consist chiefly of *Mans Flesh*, or *Sweat*, Putrified; For they  
are not those *Stinkes*, which the *Nostrils* streight abhorre, and expell,  
that are most *Pernicious*; But such *Aires*, as haue some Similitude with  
*Mans Body*; And so insinuate themselves, and betray the *Spirits*. There  
may be great danger, in vsing such Compositions, in great Meetings of  
*People*, within *Houses*; As in *Churches*; At *Arraignments*; At *Playes* and  
*Solemnities*; And the like; For *Poisoning* of *Aire* is no lesse dangerous  
than *Poisoning* of *Water*; Which hath beene vsed by the *Turkes* in the  
*Warres*; And was vsed by *Emanuel Commenus* towards the *Christians*,  
when they passed thorow his *Countrey* to the *Holy Land*. And these *Em-  
poisonments* of *Aire*, are the more dangerous in *Meetings* of *People*; Be-  
cause the much *Breath* of *People*, doth further the *Reception* of the *Infe-  
ction*: And therefore, where any such Thing is feared, it were good,  
those *Publique Places* were perfumed, before the *Assemblies*.

**T**he *Empoisonment* of Particular *Persons*, by *Odours*, hath beene re-  
ported



ported to be in *Perfumed Gloues*, or the like : And it is like, they Mingle the *Poison* that is deadly, with some *Smels* that are Sweet, which also maketh it the sooner receiued. *Plagues* also haue been raised by *Anointings* of the *Chinkes* of *Doores*, and the like ; Not so much by the Touch, as for that it is common for *Men*, when they finde any thing Wet vpon their *Fingers*, to put them to their *Nose* ; Which *Men* therefore should take heed how they doe. The best is, that these *Compositions* of *Infectious Aires*, cannot be made without *Danger of Death*, to them that make them. But then againe, they may haue some *Antidotes* to saue themselves ; So that *Men* ought not to be secure of it.

There haue beene, in diuers *Countries*, great *Plagues*, by the *Putrefaction*, of great *Swarmes* of *Grasse-Hoppers*, and *Locusts*, when they haue beene dead, and cast vpon *Heaps*.

It hapneth oft in *Mines*, that there are *Damps*, which kill, either by *Suffocation*, or by the *Poisonous Nature* of the *Minerall* : And those that deale much in *Refining*, or other *Workes* about *Metalls*, and *Mineralls*, haue their *Brains* Hurt and Stupefied by the *Metalline Vapors*. Amongst which, it is noted, that the *Spirits* of *Quick-Siluer*, either fly to the *Skull*, *Teeth*, or *Bones* ; In so much as *Gilders* vse to haue a *Peece of Gold* in their *Mouth*, to draw the *Spirits* of the *Quick-Siluer* ; Which *Gold* afterwards they finde to be *Whitened*. There are also certaine *Lakes*, and *Pits*, such as that of *Auernus*, that *Poison Birds* (as is said) which fly ouer them ; Or *Men*, that stay too long about them.

The *Vapour* of *Char-coale*, or *Sea-Coale*, in a *Close Roome*, hath killed many : And it is the more dangerous, because it commeth without any *Ill Smell* ; But stealeth on by little and little ; Enducing only a *Faintnesse*, without any *Manifest Strangling*. When the *Dutch Men* Wintred at *Noua Zembla*, and that they could gather no more *Sticks*, they fell to make *Fire* of some *Sea-Cole* they had, wherewith (at first) they were much refreshed ; But a little after they had sit about the *Fire*, there grew a *Generall Silence*, and lothnesse to speake amongst them ; And immediatly after, One of the *Weakest* of the *Company*, fell downe in a *Swone* ; Whereupon they doubting what it was, opened their doore, to let in *Aire*, and so saued themselves. The *Effect* (no doubt) is wrought by the *Inspissation* of the *Aire* ; And so of the *Breath* and *Spirits*. The like ensueth in *Roomes* newly *Plastered*, if a *Fire* be made in them ; Whereof no lesse *Man* than the Emperour *Iouinianus* Died.

Vide the *Experiment*, 803. touching the *Infectious Nature* of the *Aire*, vpon the first *Showers*, after a long *Drought*.

It hath come to passe, that some *Apothecaries*, vpon *Stamping* of *Coloquintida*, haue beene put into a great *Skouring*, by the *Vapour* only.

It hath beene a *Practice* to burne a *Pepper*, they call *Ginny-Pepper* ; Which hath such a strong *Spirit*, that it pronoketh a *Continuall Sweezing*, in those that are in the *Roome*.

It is an *Ancient Tradition*, that *Bleare-Eyes* infect *Sound-Eyes* ; And that a *Menstruous Woman*, looking vpon a *Glasse*, doth rust it. Nay they

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haue an *Opinion*, which seemeth *Fabulous*; That *Menstruous Women*, going ouer a *Field*, or *Garden*, doe *Corne* and *Herbs* good by *Killing* the *Wormes*.

924 The *Tradition* is no lesse *Ancient*, that the *Basilike* killeth by *Aspect*; And that the *Wolfe*, if he see a *Man* first, by *Aspect* striketh a *Man* hoarse.

925 *Perfumes* Conuenient doe dry and strengthen the *Braine*; And stay *Rheumes* and *Defluxions*; As we finde in *Fume* of *Rose-Mary* dried, and *Lignum Aloës*, and *Calamus*, taken at the *Mouth*, and *Nostrils*; And no doubt there be other *Perfumes*, that doe moisten and refresh; And are fit to be vsed in *Burning Agues*, *Consumptions*, and too much *Wakefulness*; Such as are, *Rose-Water*, *Vinegar*, *Limon-Pils*, *Violets*, the *Leaues* of *Vines* sprinkled with a little *Rose-Water*, &c.

926 They doe vse in *Sudden Faintings*, and *Swounings*, to put a *Handkerchiefe* with *Rose-Water*, or a *Little Vinegar*, to the *Nose*; Which gathereth together againe the *Spirits*, which are vpon point to resolute, and fall away.

927 *Tobacco* comforteth the *Spirits*, and dischargeth *Wearinesse*; Which it worketh partly by *Opening*; But chiefly by the *Opiate Vertue*, which condenseth the *Spirits*. It were good therefore to try the *Taking* of *Fumes* by *Pipes*, (as they doe in *Tobacco*,) of other *Things*; As well to dry and comfort, as for other *Intentions*. I wish *Triall* be made of the *Drying Fume*, of *Rose-Mary*, and *Lignum Aloës*, before mentioned, in *Pipes*; And so of *Nutmeg*, and *Folium Indum*; &c.

928 The *Following* of the *Plough*, hath beene approued, for *Refreshing* the *Spirits*, and *Procuring Appetite*: But to doe it in the *Ploughing* for *Wheat*, or *Rie*, is not so good; Because the *Earth* hath spent her *Sweet Breath*, in *Vegetables*, put forth in *Summer*. It is better therefore to doe it, when you sow *Barley*. But becaule *Ploughing* is tied to *Seasons*, it is best to take the *Aire* of the *Earth*, new turned vp, by *Digging* with the *Spade*; Or *Standing* by him that *Diggeth*. *Gentlewomen* may doe themselves much good by kneeling vpon a *Cushion*, and *Weeding*. And these *Things* you may practise in the best *Seasons*; Which is euer the *Early Spring*, before the *Earth* putterh forth the *Vegetables*; And in the *Sweetest Earth* you can chuse. It would be done also, when the *Dew* is a little off the *Ground*, lest the *Vapour* be too *Moist*. I knew a great *Man*, that liued *Long*, who had a *Cleane Clod* of *Earth*, brought to him euery *Morning*, as he late in his *Bed*; And he would hold his *Head* ouer it, a good pretty while. I commend also, sometimes, in *Digging* of *New Earth*, to powre in some *Malmesey*, or *Greeke Wine*; That the *Vapour* of the *Earth*, and *Wine* together, may comfort the *Spirits*, the more; Prouided alwaies, it be not taken, for a *Heathen Sacrifice*, or *Libation* to the *Earth*.

929 They haue, in *Physicke*, Vse of *Pomanders*, and *Knots* of *Powders*, for *Drying* of *Rheumes*, *Comforting* of the *Heart*, *Prouoking* of *Sleepe*, &c. For though those *Things* be not so *Strong* as *Perfumes*, yet you may haue them continually in your *Hand*; whereas *Perfumes* you can take but at *Times*;



Times; And besides, there be diuers Things, that breath better of themselves, than when they come to the Fire; As *Nigella Romana*, the Seed of *Melanthium*, *Ammonium*, &c.

There be two Things, which (inwardly used) doe Coole and condense the Spirits; And I wish the same to be tried outwardly in Vapours. The One is *Nitre*, which I would haue dissolved in *Malmesey*, or *Greeke Wine*, and so the Smell of the Wine taken; Or if you would haue it more forcible, poure of it vpon a Fire-pan, well heated, as they doe *Rose-Water*, and *Vinegar*. The other is, the Distilled Water of *Wilde Poppy*; which I wish to be mingled, at halfe, with *Rose-Water*, and so taken with some Mixture of a few Cloues, in a *Perfuming-pan*. The like would be done with the Distilled Water of *Saffron Flowers*.

Smells of *Muske*, and *Amber*, and *Cinnamon*, are thought to further Venerous Appetite. Which they may doe by the Refreshing and Calling forth of the Spirits.

*Incense*, and *Nidorous Smells*, (such as were of *Sacrifices*,) were thought to Intoxicate the Braine, and to dispose Men to *Deuotion*. Which they may doe, by a kinde of *Sadneffe*, and *Contristation* of the Spirits. And partly also by *Heating*, and *Exalting* them. We see, that amongst the *Jewes*, the Principall *Perfume* of the Sanctuary, was forbidden all Common Uses.

There be some *Perfumes*, prescribed by the Writers of *Naturall Magick*, which procure *Pleasant Dreames*; And some others, (as they say,) that procure *Propheticall Dreames*; As the Seeds of *Flax*, *Fleawort*, &c.

It is certaine, that *Odours* doe, in a small Degree, Nourish; Especiallly the *Odour of Wine*: And we see Men a hungred, doe loue to smell *Hot Bread*. It is related, that *Democritus*, when he lay a dying, heard a Woman, in the House, complaine, that she should be kept from being at a *Feast*, and *Solemnity*, (which she much desired to see,) because there would be a *Corps* in the House; Whereupon he caused *Loaves of New Bread* to be sent for, and opened them; And powred a little *Wine* into them; And so kept himselfe aliue with the *Odour* of them, till the *Feast* was past. I knew a Gentleman, that would fast (sometimes) three or foure, yea five dayes, without *Meat*, *Bread*, or *Drinke*; But the same Man vsed to haue continually, a great *Wisse* of *Herbes*, that he smelled on: and amongst those *Herbes*, some *Esculent Herbes* of strong *Sent*; As *Onions*, *Garlicke*, *Leekes*, and the like.

They doe vse, for the Accident of the Mother, to burne *Feathers*, and other Things of Ill *Odour*: And by those Ill Smells, the Rising of the Mother is put downe.

There be *Aires*, which the Physicians aduise their Patients to remoue vnto, in *Consumptions*, or vpon Recovery of Long Sickneses: Which (commonly) are *Plaine Champaignes*, but *Grasing*, and not *Over-growne* with *Heath*, or the like: Or else *Timber-Shades*, as in *Forrests*, and the like. It is noted also, that *Groves* of *Bayes* doe forbid *Pestilent Aires*; Which was accounted

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accounted a great Cause of the Wholesome Aire of *Antiochia*. There be also some *Soyles* that put forth *Oderate Herbes* of themselves; As *Wilde Thyme*; *Wilde Maioram*; *Penny-Roiall*; *Camomill*; And in which the *Briar-Roses* smell almost like *Muske-Roses*; Which (no doubt) are *Signes* that doe discover an *Excellent Aire*.

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It were good for *Men*, to thinke of hauing *Healthfull Aire*, in their *Houses*; Which will neuer be, if the *Roomes* be *Low-roofed*, or full of *Windows*, and *Doores*; For the one maketh the *Aire Close*, and not *Fresh*; And the other maketh it Exceeding *Vnequall*; Which is a great Enemy to *Health*. The *Windows* also should not be high vp to the *Roofe*, (which is in vse for *Beauty*, and *Magnificence*;) but *Low*. Also *Stone-Walls* are not wholesome; But *Timber* is more wholesome; And especially *Brick*. Nay it hath beene vsed by some, with great *Succeffe*, to make their *Walls* thicke; And to put a Lay of *Chalke* betweene the *Brickes*, to take away all *Dampishnesse*.

Experiment  
Solitary, touching the Emissions of Spirituall Species which affect the Senses.

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These *Emissions*, (as we said before,) are handled, and ought to be handled, by themselves, vnder their *Proper Titles*: That is, *Visibles*, and *Audibles*, each a-part: In this Place, it shall suffice to giue some generall *Observations*, Common to both. First, they seeme to be *Incorporeall*. Secondly, they *Worke Swiftly*. Thirdly, they *Worke at Large Distances*. Fourthly, in *Curious Varieties*. Fifthly, they are not *Effectiue* of any *Thing*; Nor leaue no *Worke* behind them; But are *Energies* meere-ly; For their *Working* vpon *Mirroures*, and *Places* of *Eccho*, doth not alter any *Thing* in those *Bodies*; But it is the same *Action* with the *Originall*, only *Repercussed*. And as for the *Shaking* of *Windows*, or *Rarefying* the *Aire* by *Great Noyses*; And the *Heat* caused by *Burning-Glasses*; They are rather *Concomitants* of the *Audible*, and *Visible Species*, than the *Effects* of them. Sixthly, they seeme to be of so *Tender*, and *Weake* a *Nature*, as they affect only such a *Rare*, and *Attenuate Substance*, as is the *Spirit* of *Living Creatures*.

Experiments in Consort, touching the Emission of Immaterial Vertues from the Minds, and Spirits of Men, either by Affections, or by Imaginations, or by other Impressions.

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It is mentioned in some *Stories*, that where *Children* haue beene *Exposed*, or taken away young from their *Parents*; And that afterwards they haue approached to their *Parents* presence, the *Parents*, (though they haue not knowne them,) haue had a *Secret Ioy*, or Other *Alteration* thereupon.

There was an *Egyptian South-Sayer*, that made *Antonius* beleue, that his *Genius*, (which otherwise was *Brave*, and *Confident*;) was, in the Presence of *Octavianus Caesar*, *Poore*, and *Cowardly*: And therefore, hee aduised him, to absent himselfe, (as much as hee could,) and remoue farre from him. This *South-Sayer* was thought to be suborned by *Cleopatra*, to make him liue in *Egypt*, and other *Remote Places* from *Rome*. Howsoeuer the *Conceit* of a *Predominant* or *Mastering Spirit*, of one *Man* ouer Another, is *Ancient*, and *Receiued still*, euen in *Vulgar Opinion*.

There



There are Conceits, that some *Men*, that are of an *Ill*, and *Melancholy Nature*, doe incline the *Company*, into which they come, to be *Sad*, and *Ill disposed*; And contrariwise, that Others, that are of a *Iouiall Nature*, doe dispose the *Company* to be *Merry* and *Cheerfull*. And againe, that some *Men* are *Luckie* to be kept *Company* with, and *Employed*; And Others *Unluckie*. Certainly, it is agreeable to *Reason*, that there are, at the least, some *Light Effluxions* from *Spirit* to *Spirit*, when *Men* are in *Presence* one with another, as well as from *Body* to *Body*.

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It hath beene obserued, that *Old Men*, who haue loued *Young Company*, and beene Conuersant continually with them, haue beene of *Long Life*; Their *Spirits*, (as it seemeth,) being Recreated by such *Company*. Such were the *Ancient Sophists*, and *Rhetoricians*; Which euer had *Young Auditors*, and *Disciples*; As *Gorgias*, *Protagoras*, *Isocrates*, &c. Who liued till they were an Hundred yeares Old. And so likewise did many of the *Grammarians*, and *Schoole-Masters*; such as was *Orbilus*, &c.

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*Audacitie* and *Confidence* doth, in Ciuill Businesse, so great Effects, as a *Man* may (reasonably) doubt; that besides the very *Daring*, and *Earnestnesse*, and *Persisting* and *Importunitie*, there should be some *Secret Binding*, and *Stooping* of other *Mens Spirits*, to such *Persons*.

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The *Affections* (no doubt) doe make the *Spirits* more *Powerfull*, and *Active*; And especially those *Affections*, which draw the *Spirits* into the *Eyes*: Which are two: *Loue*, and *Envy*, which is called *Oculus Malus*. As for *Loue*, the *Platonists*, (some of them,) goe so farre, as to hold that the *Spirit* of the *Louer*, doth passe into the *Spirits*, of the *Person Loued*; Which causeth the desire of *Returne* into the *Body*, whence it was *Emitted*: Whereupon followeth that *Appetite* of *Contact*, and *Coniunction*, which is in *Louers*. And this is obserued likewise, that the *Aspects* that procure *Loue*, are not *Gazings*, but *Sudden Glances*, and *Dartings* of the *Eye*. As for *Envy*, that emitteth some *Maligne* and *Poisonous Spirit*, which taketh hold of the *Spirit* of *Another*; And is likewise of greatest Force, when the *Cast* of the *Eye* is *Oblique*. It hath beene noted also, that it is most Dangerous, when an *Enuious Eye* is cast vpon *Persons* in *Glory*, and *Triumph*, and *Ioy*. The *Reason* whereof is, for that, at such times, the *Spirits* come forth most, into the *Outward Parts*, and so meet the *Percussion* of the *Enuious Eye*, more at *Hand*: And therefore it hath beene noted, that after great *Triumphs*, *Men* haue beene ill disposed, for some *Dayes* following. Wee see the *Opinion* of *Fascination* is *Ancient*, for both *Effects*; Of *Procuring Loue*; And *Sicknesse* caused by *Envy*: And *Fascination* is euer by the *Eye*. But yet if there be any such *Infection* from *Spirit* to *Spirit*, there is no doubt, but that it worketh by *Presence*, and not by the *Eye* alone; Yet most forcibly by the *Eye*.

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*Feare*, and *Shame*, are likewise *Infective*; for wee see that the *Starting* of one will make another readie to *Start*: And when one *Man* is out of *Countenance* in a *Company*, others doe likewise *Blush* in his behalfe.

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Now



Now we will speake of the Force of *Imagination* vpon other *Bodies*; And of the *Meanes* to *Exalt* and *Strengthen* it. *Imagination*, in this Place, I vnderstand to be, the *Representation* of an *Individuall Thought*. *Imagination* is of three Kinds: The First *Ioynd* with *Beleeve* of that which is to *Come*: The Second *Ioynd* with *Memory* of that which is *Past*: And the Third is of *Things Present*, or as if they were *Present*; For I comprehend in this, *Imaginations Faigned*, and at *Pleasure*; As if one should *Imagine* such a *Man* to be in the *Vestments* of a *Pope*; Or to haue *Wings*. I single out, for this time, that which is with *Faith*, or *Beleeve* of that which is to *Come*. The *Inquisition* of this *Subiect*, in our way, (which is by *Induction*,) is wonderfull hard; for the *Things* that are reported, are full of *Fables*; And *New Experiments* can hardly be made, but with *Extreme Caution*, for the *Reason* which we will hereafter declare.

The *Power* of *Imagination* is in three Kindes; The First, vpon the *Body* of the *Imaginant*; Including likewise the *Childe* in the *Mothers Wombe*; The Second is, the *Power* of it vpon *Dead Bodies*, as *Plants*, *Wood*, *Stone*, *Metall*, &c. The Third is, the *Power* of it, vpon the *Spirits* of *Men* and *Living Creatures*: And with this last we will only meddle.

The *Probleme* therefore is, whether a *Man* *Constantly* and *Strongly Beleeuing*, that such a *Thing* shall be; (As that such an *One* will *Loue Him*; Or that such an *One* will *Grant him* his *Request*; Or that such an *One* shall *Recover* a *Sicknesse*; Or the like;) It doth helpe any thing to the *Effecting* of the *Thing* it selfe. And here againe we must warily distinguish; For it is not meant, (as hath bene partly said before,) that it should helpe by *Making* a *Man* more *Stout*, or more *Industrious*; (In which kinde a *Constant Beleeve* doth much;) But meerely by a *Secret Operation*, or *Binding*, or *Changing* the *Spirit* of *Another*: And in this it is hard, (as we began to say,) to make any *New Experiment*; For I cannot *command* my *Selfe* to *Beleeue* what I will, and so no *Triall* can be made. Nay it is worse; For whatsoeuer a *Man* *Imagineth* doubtingly, or with *Feare*, must needs doe hurt, if *Imagination* haue any *Power* at all,  
For



For a *Man* representeth that oftner, that he feareth, than the contrary.

The Helpe therefore is, for a *Man* to worke by *Another*, in whom he may Create *Beleeve*, and not by *Himselfe*; Vntill *Himselfe* haue found by *Experience*, that *Imagination* doth preuaile; For then *Experience* worketh in *Himselfe Beleeve*; If the *Beleeve*, that such a *Thing* shall be, be ioyned with a *Beleeve*, that his *Imagination* may procure it.

For Example; I related one time to a *Man*, that was Curious, and Vaine enough in these Things; *That I saw a Kinde of Iugler, that had a Paire of Cards, and would tell a Man what Card he thought.* This Pretended Learned Man told me; It was a Mistaking in Me; For (*said hee*) *it was not the Knowledge of the Mans Thought, (for that is Proper to God,) but it was the Inforcing of a Thought vpon him, and Binding his Imagination by a Stronger, that he could Thinke no other Card.* And thereupon he asked me a *Question*, or two, which I thought he did but cunningly, knowing before what vsed to be the *Feats* of the *Iugler*. *Sir, (said he,) doe you remember whether he told the Card, the Man thought, Himselfe, or bade Another to tell it.* I answered (as was true;) *That he bade Another tell it.* Whereunto he said; *So I thought: For (said he) Himselfe could not haue put on so strong an Imagination; But by telling the other the Card, (who beleeued that the Iugler was some Strange Man, and could doe Strange Things,) that other Man caught a strong Imagination.* I harkened vnto him, thinking for a Vanity he spoke prettily. Then he asked me another *Question*: *Saith he; Doe you remember, whether he bade the Man thinke the Card first, and afterwards told the other Man in his Eare, what hee should thinke, Or else that he did whisper first in the Mans Eare, that should tell the Card, telling that such a Man should thinke such a Card, and after bade the Man thinke a Card?* I told him, as was true; *That he did first whisper the Man in the Eare, that such a Man should thinke such a Card: Vpon this the Learned Man did much Exult, and Please himselfe, saying; Loe, you may see that my Opinion is right: For if the Man had thought first, his Thought had bene Fixed; But the other Imagining first, bound his Thought.* Which though it did somewhat sinke with mee, yet I made it Lighter than I thought, and said; *I thought it was Confederacie, betweene the Iugler, and the two Seruants: Though (Indeed) I had no Reason so to thinke: For they were both my Fathers Seruants; And he had neuer plaid in the House before. The Iugler also did cause a Garter to be held vp; And tooke vpon him, to know, that such a One, should point in such a Place, of the Garter; As it should be neare so many Inches to the Longer End, and so many to the Shorter; And still he did it, by First Telling the Imaginer, and after Bidding the Actor Thinke.*

Hauiing told this Relation, not for the Weight thereof, but because



because it doth handsomely open the Nature of the *Question*; I returne to that I said; That *Experiments of Imagination*, must be practised by Others, and not by a *Mans Selfe*. For there be *Three Meanes* to fortifie *Beleeve*: The First is *Experience*: The Second is *Reason*: And the Third is *Authoritie*: And that of these, which is farre the most *Potent*, is *Authoritie*: For *Beleeve* vpon *Reason*, or *Experience*, will Stagger.

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For *Authoritie*, it is of two Kinde; *Beleeve* in an *Art*; And *Beleeve* in a *Man*. And for Things of *Beleeve* in an *Art*; A *Man* may exercise them by *Himselfe*; But for *Beleeve* in a *Man*, it must be by *Another*. Therefore, if a *Man* beleeue in *Astrologie*, and finde a *Figure* Prosperous; Or beleeue in *Naturall Magicke*, and that a *Ring* with such a *Stone*, or such a *Peece of a Living Creature*, Carried, will doe good; It may helpe his *Imagination*: But the *Beleeve* in a *Man* is farre the more *Active*. But howsoener, all *Authoritie* must be out of a *Mans Selfe*, turned (as was said,) either vpon an *Art*, or vpon a *Man*: And where *Authoritie* is from one *Man* to another, there the Second must be *Ignorant*, and not *Learned*, or *Full of Thoughts*; And such are (for the most part) all *Witches*, and *Superstitious Persons*; Whose *Beleeves*, tied to their *Teachers*, and *Traditions*, are no whit controlled, either by *Reason*, or *Experience*: And vpon the same Reason, in *Magicke*, they vse (for the most part,) *Boyes*, and *Young People*; whose *Spirits* easiliest take *Beleeve*, and *Imagination*.

Now to fortifie *Imagination*, there be three Wayes: The *Authoritie* whence the *Beleeve* is deriued; *Meanes* to *Quicken* and *Corroborate* the *Imagination*; And *Meanes* to *Repeat* it, and *Refresh* it.

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For the *Authoritie*, wee haue already spoken; As for the Second; Namely the *Meanes* to *Quicken*, and *Corroborate* the *Imagination*; We see what hath beene vsed in *Magicke*; (If there be in those Practises any thing that is purely *Naturall*;) As *Vestments*; *Characters*; *Words*; *Seales*; Some *Parts of Plants*, or *Living Creatures*; *Stones*; *Choice of the Houre*; *Gestures* and *Motions*; Also *Incense*, and *Oodours*; *Choice of Society*, which increaseth *Imagination*; *Diets* and *Preparations* for some time before. And for *Words*, there haue beene euer vsed, either *Barbarous Words*, of no Sense, lest they should disturbe the *Imagination*; Or *Words of Similitude*, that may second and feed the *Imagination*: And this was euer as well in *Heathen Charmes*, as in *Charmes* of latter Times. There are vsed also *Scripture Words*; For that the *Beleeve*, that *Religious Texts*, and *Words*, haue Power, may strengthen the *Imagination*. And for the same Reason, *Hebrew Words*, (which amongst vs is counted the *Holy Tongue*, and the *Words* more *Mysticall*;) are often vsed.

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For the *Refreshing* of the *Imagination*, (which was the Third *Meanes* of *Exalting* it;) Wee see the Practices of *Magicke*, as in *Images of Wax*, and



and the like, that should Melt by little, and little; Or some other Things Buried in Mucke, that should Putrifie by little and little; Or the like: For so oft as the *Imaginant* doth thinke of those Things, so oft doth he represent to his *Imagination*, the Effect of that he desireth.

If there be any Power in *Imagination*, it is lesse credible, that it should be so *Incorporeall* and *Immateriate* a Vertue, as to worke at great Distances; Or through all *Mediums*; Or vpon all *Bodies*: But that the Distance must be Competent; The *Medium* not Aduerse; And the *Body* Apt and Proportionate. Therefore if there be any Operation vpon *Bodies*, in Absence, by Nature; it is like to be conueyed from Man to Man, as Fame is; As if a Witch by *Imagination*, should hurt any afaire off, it cannot bee naturally, but by Working vpon the Spirit of some, that commeth to the Witch; And from that Party vpon the *Imagination* of Another; And so vpon Another; till it come to one that hath resort to the Party Intended; And so by Him to the Party intended himselfe. And although they speake, that it sufficeth, to take a Point, or a Peece of the Garment, or the Name of the Party, or the like; yet there is lesse Credit to bee giuen to those Things, except it be by Working of euill Spirits.

The Experiments, which may certainly demonstrate the Power of *Imagination*, vpon other *Bodies*, are few, or none: For the Experiments of Witchcraft, are no cleare Prooves; For that they may be, by a Tacite Operation of Maligne Spirits: We shall therefore be forced, in this Enquirie, to resort to New Experiments: Wherein we can giue only Directions of Trials, and not any Positiue Experiments. And if any Man thinke, that wee ought to haue staied, till wee had made Experiment, of some of them, our selues, (as wee doe commonly in other Titles) the Truth is, that these Effects of *Imagination* vpon other *Bodies*, haue so little Credit with vs, as we shall try them at leisure: But in the meane Time, we will lead others the way.

When you worke by the *Imagination* of Another, it is necessary, that He, by whom you worke, haue a Precedent Opinion of you, that you can doe Strange Things; Or that you are a Man of Art, as they call it; For else the Simple Affirmation to Another, that this or that shall bee, can worke but a weake Impression, in his *Imagination*.

It were good, because you cannot discerne fully of the Strength of *Imagination*, in one Man more than another, that you did vse the *Imagination* of more than One; That so you may light vpon a Strong One. As if a Physitian should tell Three, or Foure, of his Patients Seruants, that their Master shall surely recouer.

The *Imagination* of One, that you shall vse, (such is the Variety of Mens Mindes,) cannot be alwaies alike Constant, and Strong; And if the



Successes follow not speedily, it will faint and lesse *Strength*. To remedy this, you must pretend to Him, whose *Imagination* you vse, severall *Degrees of Meanes*, by which to *Operate*; As to prescribe him, that every three Daies, if he finde not the Successes Apparant, he doe vse another *Root*, or *Part* of a *Beast*, or *Ring*, &c. As being of more *Force*; And if that faile, Another; And if that, Another; till Seven Times. Also you must prescribe a good Large Time for the *Effect* you promise; As if you should tell a *Servant* of a *Sick-man*, that his *Master* shall recover, but it will be Fourteene daies, ere hee findeth it apparantly, &c. All this to entertaine the *Imagination*, that it wauer lesse.

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It is certaine, that *Potions*, or *Things* taken into the *Body*: *Incenses* and *Perfumes* taken at the *Nostrils*; And *Ointments* of some *Parts*; doe (naturally) worke vpon the *Imagination* of Him that taketh them. And therefore it must needs greatly *Cooperate* with the *Imagination* of him, whom you vse, if you prescribe him, before he doe vse the *Receit*, for the *Worke* which he desireth, that he doe take such a *Pill*, or a *Spoonfull* of *Liquor*; Or burne such an *Incense*; Or *Anoint* his *Temples*, or the *Soles* of his *Feet*, with such an *Ointment*, or *Oyle*: And you must chuse, for the *Composition* of such *Pill*, *Perfume*, or *Ointment*, such *Ingredients*, as doe make the *Spirits*, a little more *Grosse*, or *Muddy*: Whereby the *Imagination* will fix the better.

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The *Body Passive*, and to be *Wrought vpon*, (I meane not of the *Imaginant*;) is better wrought vpon (as hath beene partly touched) at some *Times*, than at others: As if you should prescribe a *Servant*, about a *Sick Person* (whom you haue possessed, that his *Master* shall recover) when his *Master* is fast asleepe, to vse such a *Root*, or such a *Root*. For *Imagination* is like to worke better vpon *Sleeping Men*, than *Men Awake*. As we shall shew when we handle *Dreames*.

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Wee finde in the *Art* of *Memory*, that *Images Visible*, worke better than other *Conceits*: As if you would remember the Word *Philosophy*, you shall more surely doe it, by *Imagining* that such a *Man*, (For *Men* are best *Places*) is reading vpon *Aristotles Physickes*; Than if you should *Imagine* him to say; *I'll goe study Philosophy*. And therefore, this *Observation* would be translated to the *Subject* wee now speake of: For the more *Lustrous* the *Imagination* is, it filleth and fixeth the better. And therefore I conceiue, that you shall, in that *Experiment* (whereof wee spake before) of *Binding of Thoughts*, lesse faile, if you tell One, that such an *One* shal name one of *Twenty Men*, than if it were *One* of *Twenty Cards*. The *Experiment* of *Binding of Thoughts*, would be *Diuerfied*, and tried to the Full: And you are to note, whether it hit for the most part, though not alwaies.

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It is good to consider, vpon what *Things*, *Imagination* hath most *Force*: And the *Rule* (as I conceiue) is, that it hath most *Force* vpon *Things*, that haue the *Lightest*, and *Easiest Motions*. And therefore aboue all, vpon the *Spirits* of *Men*: And in them, vpon such *Affections*, as moue *Lightest*; As vpon *Procuring* of *Loue*; *Binding* of *Lust*, which is

euer



euier with *Imagination*; vpon *Men* in *Feare*; Or *Men* in *Irresolution*; And the like. Whatsoeuer is of this kinde would be thoroughly enquired. *Trialls* likewise would be made vpon *Plants*, and that diligently: As if you should tell a *Man*, that such a *Tree* would Die this yeere; And will him, at these and these times, to goe vnto it, to see how it thriue. As for *Inanimate Things*, it is true, that the *Motions* of *Shuffling* of *Cards*, or *Casting* of *Dice*, are very *Light Motions*; And there is a *Folly* very vsuall, that *Gamesters* imagine, that some that stand by them, bring them ill Lucke. There would be *Triall* also made, of holding a *Ring* by a *Threed* in a *Glasse*, and telling him that holdeth it, before, that it shall strike so many times against the *Side* of the *Glasse*, and no more; Or of Holding a *Key* betweene two *Mens Fingers*, without a *Charme*; And to tell those that hold it, that at such a *Name*, it shall goe off their *Fingers*: For these two are Extreme *Light Motions*. And howsoeuer I haue no *Opinion* of these things, yet so much I conceiue to be true; That *Strong Imagination* hath more Force vpon *Things Liuing*; Or that haue beene *Liuing*, than *Things* meerely *Inanimate*: And more Force likewise vpon *Light*, and *Subtill Motions*, than vpon *Motions Vehement*, or *Ponderous*.

It is an vsuall *Observation*, that if the *Body* of One *Murdered*, bee brought before the *Murderer*, the *Wounds* will bleed afresh. Some doe affirme, that the *Dead Body*, vpon the Presence of the *Murderer*, hath opened the *Eyes*; And that there haue beene such like *Motions*, as well where the *Party Murdered* hath beene *Strangled*, or *Drowned*, as where they haue beene *Killed* by *Wounds*. It may be, that this participateth of a *Miracle*, by Gods Iust Iudgement, who vsuallly bringeth *Murthers* to *Light*: But if it be *Naturall*, it must be referred to *Imagination*.

The *Tying* of the *Point* vpon the day of *Marriage*, to make *Men* Impotent towards their *Wives*, which (as we haue formerly touched,) is so frequent in *Zant* and *Gascony*, if it be *Naturall*, must be referred to the *Imagination* of Him that *Tieth* the *Point*. I conceiue it to haue the lesse Affinity with *Witchcraft*, because not Peculiar Persons onely, (such as *Witches* are) but any *Body* may doe it.

There be many *Things*, that worke vpon the *Spirits* of *Man*, by *Secret Sympathy*, and *Antipathy*: The *Vertues* of *Precious Stones*, worne, haue bin anciently and generally Receiued; And curiously assigned to worke seuerall *Effects*. So much is true; That *Stones* haue in them fine *Spirits*; As appeareth by their *Splendor*: And therefore they may worke by *Consent* vpon the *Spirits* of *Men*, to Comfort, and Exhilarate them. Those that are the best, for that *Effect*, are the *Diamond*, the *Emerald*, the *Iacinth Orientall*, and the *Gold Stone*, which is the *Yellow Topaze*. As for their particular *Proprieties*, there is no Credit to be giuen to them. But it is manifest, that *Light*, aboue all things, excelleth in *Comforting* the *Spirits* of *Men*: And it is very probable, that *Light Varied* doth the same *Effect*, with more *Novelty*. And this is one of the *Causes*, why *Precious Stones* comfort. And therefore it were good to haue *Tinted Lanthornes*,

Experiments  
in Consort,  
touching the  
Secret Vertue of  
Sympathy, and  
Antipathy.

960



or Tincted Skreenes, of Glasse Coloured into Greene, Blaw, Carnation, Crimson, Purple, &c. And to vse them with Candles in the Night. So likewise to haue Round Glasses, not only of Glasse Coloured aboue, but with Colours laid betweene Crystals, with Handles to hold in ones Hand. Prismes, are also Comfortable Things. They haue of Paris Worke, Looking Glasses, bordered with broad Borders of small Crystall, and great Counterfeit Precious Stones, of all Colours, that are most Glorious and Pleasant to behold; Especially in the Night. The Pictures of Indian Feathers, are likewise Comfortable, and Pleasant to behold. So also Faire and Gleere Pooles doe greatly comfort the Eyes and Spirits; Especially when the Sun is not Glaring, but Over-cast; Or when the Moone shineth.

961

There be diuers Sorts of Bracelets fit to Comfort the Spirits; And they be of Three Intentions: Refrigerant; Corroborant; and Aperient. For Refrigerant, I wish them to be of Pearle, or of Corall, as is vsed: And it hath beene noted that Corall, if the Party that weareth it be ill disposed, will wax Pale: Which I beleue to be true, because otherwise Distemper of Heat will make Corall lose Colour. I commend also Beads, or little Plates of Lapis Lazuli; And Beads of Nitre, either alone, or with some Cordiall Mixture.

962

For Corroboration and Confortation, take such Bodies as are of Astringent Quality, without Manifest Cold. I commend Bead Amber; which is full of Astriction, but yet is Viscuous, and not Cold; And is conceiued to Impinguate those that weare such Beads: I commend also, Beads of Harts-Horne, and Ivory, which are of the like Nature; Also Orange-Beads; Also Beads of Lignum aloës, Macerated first in Rose-Water, and Dried.

963

For Opening, I commend Beads, or Peeces of the Roots of Carduus Benedictus: Also of the Roots of Piony the Male; And of Orris; And of Calamus Arborescens; And of Rew.

964

The Crampe, (no doubt,) commeth of Contraction of Sinnewes; Which is Manifest, in that it commeth either by Cold or Drinesse; As after Consumptions, and Long Agues: For Cold and Drinesse doe (both of them) Contract, and Corrugate. We see also, that Chafing a little about the Place in paine, easeth the Crampe; Which is wrought by the Dilatation, of the Contracted Sinnewes, by Heat. There are in vse for the Preuention of the Cramp, two Things; The one Rings of Sea-Horse-Teeth, worne vpon the Fingers; The other Bands of Greene Periwinkle (the Herbe) tied about the Calf of the Leg, or the Thigh, &c. where the Crampe vseth to come. I doe finde this the more strange, because Neither of these haue any Relaxing Vertue, but rather the Contrary. I iudge therefore, that their Working is, rather vpon the Spirits, within the Nerves, to make them stricke lesse; Than vpon the Bodily Substance of the Nerves.

965

I would haue Triall made of two other Kindes of Bracelets, for Comforting the Heart, and Spirits; The one of the Trochisch of Vipers, made into little Peeces of Beads; For since they do great Good Inwards (especially for Pestilent Agues) it is like they will be Effectuell Outwards; Where they may be applied in greater Quantity. There wold be Trochisch likewise made



made of Snakes; Whose *Flesh* dried, is thought to haue a very *Opening*, and *Cordiall Vertue*. The other is, of *Beads* made of the *Scarlet Powder*, which they call *Kermes*; Which is the Principall *Ingredient* in their *Cordiall Confection Alkermes*: The *Beads* would be made vp with *Amber-Grice*, and some *Pomander*.

It hath beene long receiued, and confirmed by diuers *Trialls*; That the Root of the *Male-Piony*, dried, tied to the *Necke*, doth helpe the *Falling-Sicknesse*; And likewise the *Incubus*, which wee call the *Mare*. The Cause of both these *Diseases*, and especially of the *Epilepsie* from the *Stomach*, is the *Grossnesse* of the *Vapours*, which rise and enter into the *Cells* of the *Braine*: And therefore the *Working* is, by *Extreme*, and *Subtill Attenuation*; Which that *Simple* hath. I iudge the like to be in *Castoreum*, *Muske*, *Rew-Seed*, *Agnus Castus Seed*, &c.

There is a *Stone*, which they call the *Blond-Stone*, which worne is thought to be good for them that *Bleed* at the *Nose*: Which (no doubt) is by *Astriction* and *Cooling* of the *Spirits*. *Quare*, if the *Stone* taken out of the *Toads Head*, be not of the like *Vertue*? For the *Toad* loueth *Shade*, and *Coolenesse*.

*Light* may bee taken from the *Experiments* of the *Horse-Tooth-Ring*, and the *Garland* of *Periwinkle*, how that those things, which asswage the *Strife* of the *Spirits*, doe helpe diseases, contrary to the *Intention* desired: For in the *Curing* of the *Crampe*, the *Intention* is to relax the *Sinewes*; But the *Contraction* of the *Spirits*, that they strue lesse, is the best *Helpe*: So to procure easie *Tranaiels* of *Women*, the *Intension* is to bring downe the *Childe*; But the best *Helpe* is, to stay the *Comming* downe too *Fast*: Whereunto they say, the *Toad-Stone* likewise helpeth. So in *Pestilent Feuers*, the *Intention* is to expell the *Infection* by *Sweat*, and *Evaporation*; But the best *Meanes* to doe it, is by *Nitre*, *Diascordium*, and other *Cooler Things*, which doe for a time arrest the *Expulsion*, till *Nature* can doe it more quietly. For as one saith prettily; *In the Quenching of the Flame of a Pestilent Ague*, *Nature* is like *People*, that come to quench the *Fire of a House*; which are so busie, as one of them letteth another. Surely, it is an *Excellent Axiome*, and of *Manifold Vse*, that whatsoever appeareth the *Contention* of the *Spirits*, furthereth their *Action*.

The *Writers* of *Naturall Magicke*, commend the *Wearing* of the *Spoile* of a *Snake*, for *Preseruing* of *Health*. I doubt it is but a *Conceit*; For that the *Snake* is thought to renew her *Youth*, by *Casting* her *Spoile*. They might as well take the *Beake* of an *Eagle*, or a *Peece* of a *Harts-Horne*, because those *Renue*.

It hath beene *Anciently Receiued*, (For *Pericles* the *Athenian* vsed it,) and it is yet in *vse*, to weare little *Bladders* of *Quick-Siluer*, or *Tablets* of *Arsenicke*, as *Preseruatiues* against the *Plague*: Not as they conceiue, for any *Comfort* they yeeld to the *Spirits*, but for that being *Poisons* themselves, they draw the *Venome* to them, from the *Spirits*.

*Vide* the *Experiments* 95. 96. and 97. touching the *Seuerall Sympathies*, and *Antipathies*, for *Medicinall Vse*.



- 972 It is said, that the *Guts* or *Skin* of a *Wolfe* being applied to the *Belly*, doe cure the *Cholicke*. It is true, that the *Wolfe* is a *Beast* of great *Educy*, and *Disgestion*; And so, it may bee, the *Parts* of him comfort the *Bowels*.
- 973 We see *Scare-Crowes*, are set vp to keepe *Birds* from *Corn*, and *Fruit*; It is reported by some, that the *Head* of a *Wolfe*, whole, dried, and hanged vp in a *Doue-House*, will scare away *Vermine*; Such as are *Weasils*, *Polcats*, and the like. It may be, the *Head* of a *Dog* will doe as much; For those *Vermine* with vs, know *Dogs* better than *Wolues*.
- 974 The *Braines* of some *Creatures* (when their *Heads* are roasted) taken in *Wine*, are said to strengthen the *Memory*: As the *Braines* of *Hares*; *Braines* of *Hens*; *Braines* of *Deeres*, &c. And it seemeth, to bee incident to the *Braines* of those *Creatures*, that are *Fearfull*.
- 975 The *Ointment* that *Witches* vlc, is reported to be made, of the *Fat* of *Children*, digged out of their *Graves*; Of the *Iuyces* of *Smallage*, *Wolfebane*, and *Cinquefoile*; Mingled with the *Meale* of fine *Wheat*. But I suppose that the *Soporiferous Medicines* are likeliest to doe it; Which are *Henbane*, *Hemlocke*, *Mandrake*, *Moone-Shade*, *Tobacco*, *Opium*, *Saffron*, *Poplar-Leaves*, &c.
- 976 It is reported by some, that the *Affections* of *Beasts*, when they are in *Strength*, doe adde some *Vertue*, vnto *Inanimate Things*; As that the *Skin* of a *Sheepe*, deuoured by a *Wolfe*, moueth *Itching*; That a *Stone* bitten by a *Dog* in *Anger*, being throwne at him, drunke in *Powder*, prouoketh *Choler*.
- 977 It hath beene obserued, that the *Diet* of *Women* with *Childe*, doth worke much vpon the *Infant*; As if the *Mother* eat *Quinces* much, and *Coriander-Seed* (the *Nature* of both which is to repress and stay *Vapours*, that ascend to the *Braine*) it will make the *Childe* *Ingenious*: And on the contrary side, if the *Mother* eat (much) *Onions*, or *Beanes*, or such *Vapourous Food*; Or drinke *Wine*, or *Strong Drinke*, immoderately; Or *Fast* much; Or be giuen to much *Musing*; (All which send, or draw *Vapours* to the *Head*.) It endangereth the *Childe* to become *Lunaticke*, or of *Imperfect Memory*: And I make the same Iudgement of *Tobacco*, often taken by the *Mother*.
- 978 The *Writers* of *Naturall Magicke* report, that the *Heart* of an *Ape*, worne neere the *Heart*, comforteth the *Heart*, and increaseth *Andacity*. It is true, that the *Ape* is a *Merry* and *Bold Beast*. And that the same *Heart* likewise of an *Ape*, applied to the *Necke*, or *Head*, helpeth the *Wit*; And is good for the *Falling-Sicknesse*: The *Ape* also is a *Witty Beast*, and hath a *Dry Braine*; Which may be some *Cause* of *Attenuation* of *Vapours* in the *Head*. Yet it is said to moue *Dreames* also. It may be, the *Heart* of a *Man* would doe more, but that it is more against *Mens Mindes* to vse it; Except it be in such as were the *Reliques* of *Saints*.
- 979 The *Flesh* of a *Hedge-Hog*, Dressed, & Eaten, is said to be a great *Drier*: It is true, that the *Iuyce* of a *Hedge-Hog*, must needs be *Harsh* and *Dry*, because it putteth forth so many *Prickles*: For *Plants* also, that are full of *Prickles*,



*Prickles*, are generally Drie: As *Briars*, *Thornes*, *Berberries*: And therefore the *Ashes* of a *Hedge-Hog* are said to be a great *Deficcative* of *Fistula's*.

*Mummy* hath great force in *Stanching* of *Bloud*; which, as it may be ascribed to the *Mixture* of *Balmes*, that are *Glutinous*; So it may also partake of a *Secret Propriety*; In that the *Bloud* draweth *Mans Fleſh*. And it is approued, that the *Mosse*, which groweth vpon the *Skull* of a *Dead Man*, vnburied, will stanch *Bloud* potently. And so doe the *Dregs*, or *Powder* of *Bloud*, seuered from the *Water*, and *Dried*.

It hath beene practised, to make *White Swallowes*, by *Annointing* of the *Egges* with *Oyle*. Which *Effect* may be produced, by the *Stopping* of the *Pores* of the *Shell*, and making the *Iuyce*, that putteth forth the *Feathers* afterwards, more *Penurious*. And it may be, the *Annointing* of the *Egges*, will be as *Effectuall*, as the *Annointing* of the *Body*; Of which *Vide* the *Experiment* 93.

It is reported, that the *White* of an *EGGE*, or *Bloud*, mingled with *Salt-Water*, doth gather the *Saltneſſe*, and maketh the *Water* sweeter. This may be by *Adheſion*; As in the 6. *Experiment* of *Clarification*: It may be also, that *Bloud*, and the *White* of an *EGGE*, (which is the *Matter* of a *Living Creature*,) haue some *Sympathy* with *Salt*: For all *Life* hath a *Sympathy* with *Salt*. We see that *Salt*, laid to a *Cut Finger*, healeth it; So as it seemeth *Salt* draweth *Bloud*, as well as *Bloud* draweth *Salt*.

It hath beene anciently receiued, that the *Sea-Hare*, hath an *Antipathy* with the *Lungs*, (if it commeth neare the *Body*,) and erodeth them. Whereof the *Cause* is conceiued to be, a *Quality* it hath of *Heating* the *Breath*, and *Spirits*; As *Cantharides* haue vpon the *Watric Parts* of the *Body*; As *Vrine* and *Hydropicall Water*. And it is a good *Rule*, that whatsoever hath an *Operation* vpon certaine *Kindes* of *Matters*, that, in *Mans Bodie*, worketh most vpon those *Parts*, wherein that *Kinde* of *Matter* aboundeth.

Generally, that which is *Dead*, or *Corrupted*, or *Excerned*, hath *Antipathy* with the same *Thing*, when it is *Aline*, and when it is *Sound*; And with those *Parts* which doe *Excerne*: As a *Carkasse* of *Man* is most *Infectious*, and *Odious* to *Man*; A *Carrion* of an *Horse* to an *Horse*, &c. *Purulent Matter* of *Wounds*, and *Vlcers*, *Carbuncles*, *Pockes*, *Scabs*, *Leprosie*, to *Sound Fleſh*; And the *Excrement* of euery *Species* to that *Creature* that *Excerneth* them. But the *Excrements* are lesse *Pernicious* than the *Corruptions*.

It is a *Common Experience*, that *Dogs* know the *Dog-Killer*; When as in times of *Infection*, some *Petty Fellow* is sent out to kill the *Dogs*; And that, though they haue neuer scene him before, yet they will all come forth, and barke, and fly at him.

The *Relations* touching the *Force* of *Imagination*, and the *Secret Instincts* of *Nature*, are so vncertaine, as they require a great deale of *Examination*, ere we conclude vpon them. I would haue it first thoroughly inquired, whether there be any *Secret Passages* of *Sympathy*, betweene

Persons

980

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*Persons of neare Blood; As Parents, Children, Brothers, Sisters, Nurse-Children, Husbands, Wives, &c.* There be many Reports in *History*, that vpon the *Death* of *Persons* of such Nearenesse, *Men* haue had an inward *Feeling* of it. I my *Selfe* remember, that being in *Paris*, and my *Father* dying in *London*, two or three dayes before my *Fathers* death, I had a *Dream*, which I told to diuers *English Gentlemen*; That my *Fathers House*, in the *Countrey*, was *Plastered* all ouer with *Blacke Mortar*. There is an *Opinion* abroad, (whether *Idle* or no I cannot say,) That louing and kinde *Husbands*, haue a *Sense* of their *Wives Breeding Childe*, by some *Accident* in their owne *Bodie*.

987

Next to those that are *Neare* in *Blood*, there may be the like *Passage*, and *Instincts* of *Nature*, betweene great *Friends*, and *Enemies*: And sometimes the *Reuealing* is vnto Another *Person*, and not to the *Party* Him-*selfe*. I remember *Philippus Commineus*, (a graue *Writer*,) reporteth; That the *Arch-Bishop* of *Vienna*, (a *Reuerend Prelate*,) said (one day) after *Mass*, to *King Lewis* the eleuenth of *France*; *Sir, your Mortall Enemy is dead*; What time *Duke Charles* of *Burgundy* was *Slaine*, at the *Battel* of *Granson*, against the *Switzers*. Some triall also would be made, whether *Pact* or *Agreement* doe any thing; As if two *Friends* should agree, that such a *Day* in euery *Week*, they being in farre *Distant Places*, should *Pray* one for Another; Or should put on a *Ring*, or *Tablet*, one for anothers *Sake*; Whether if one of them should breake their *Vow* and *Promise*, the other should haue any *Feeling* of it, in *Absence*.

988

If there be any *Force* in *Imagination*, and *Affections* of *Singular Persons*; It is Probable the *Force* is much more in the *loyal Imaginations* and *Affections* of *Multitudes*: As if a *Victory* should be won, or lost, in *Remote Parts*, whether is there not some *Sense* thereof, in the *People* whom it concerneth; Because of the great *loy*, or *Griefe*, that many *Men* are posselt with, at once? *Pius Quintus*, at the very time, when that Memorable *Victory* was won, by the *Christians*, against the *Turkes*, at the *Navall Battell* of *Lepanto*, being then hearing of *Causes* in *Consistory*, brake off suddenly, and said to those about him; *It is now more time, we should giue thanks to God, for the great Victory he hath granted vs, against the Turkes*. It is true, that *Victory* had a *Sympathy* with his *Spirit*; For it was meere-ly his *Woork*, to conclude that *League*. It may be, that *Reuelation* was *Di- uine*; But what shall we say then, to a Number of *Examples*, amongst the *Grecians*, and *Romans*? Where the *People*, being in *Theaters* at *Playes*, haue had *Newes* of *Victories*, and *Ouerthrowes*, some few dayes, before any *Messenger* could come.

It is true, that that may hold in these Things, which is the generall *Root* of *Superstition*: Namely, that *Men* obserue when Things *Hiss*, and not when they *Misse*: And commit to *Memory* the one, And forget and passe ouer the other. But touching *Diuination*, and the *Misgiuing* of *Mindes*, wee shall



shall speake more, when we handle in generall, the Nature of Mindes, and Soules, and Spirits.

We haue giuen formerly some *Rules of Imagination*; And touching the *Fortifying* of the Same. We haue set downe also some few *Instances*, and *Directions*, of the *Force of Imagination*, vpon *Beasts*, *Birds*, &c. vpon *Plants*; And vpon *Inanimate Bodies*: Wherein you must still obserue, that your *Trialls* be vpon *Subtill* and *Light Motions*, and not the contrary; For you will sooner, by *Imagination*, binde a *Bird* from *Singing*, than from *Eating*, or *Flying*: And I leaue it to euery *Man*, to choose *Experiments*, which himselfe thinketh most *Commodious*; Giuing now but a few *Examples* of euery of the Three *Kindes*.

Vse some *Imaginant*, (obseruing the *Rules* formerly prescribed,) for *Binding* of a *Bird* from *Singing*; And the like of a *Dog* from *Barking*. Trie also the *Imagination* of some, whom you shal accommodate with things to fortifie i<sup>n</sup>, in *Cocke-Fights*, to make one *Cocke* more *Hardy*, and the other more *Cowardly*. It would be tried also, in *Flying* of *Hawkes*; Or in *Coursing* of a *Deere*, or *Hare*, with *Grey-Hounds*; Or in *Horse-Races*; And the like *Comparatiue Motions*: For you may sooner by *Imagination*, quicken or slacke a *Motion*, than raise or cease it; As it is easier to make a *Dog* goe slower, than to make him stand still that he may not runne.

In *Plants* also, you may trie the *Force of Imagination*, vpon the *Lighter* Sort of *Motions*: As vpon the *Sudden Fading*, or *Liuely Comming vp* of *Herbes*; Or vpon their *Bending* one way, or other; Or vpon their *Closing*, and *Opening*; &c.

For *Inanimate Things*, you may trie the *Force of Imagination*, vpon *Staying* the *Working* of *Beere*, when the *Barme* is put in; Or vpon the *Comming* of *Butter*, or *Cheese*, after the *Cherming*, or the *Rennes* bee put in.

It is an *Ancient Tradition*, euery where alleaged, for *Example* of *Secret Proprieties* and *Influxes*, that the *Torpedo Marina*, if it be touched with a long *Sticke*, doth stupefie the *Hand* of him that toucheth it. It is one degree of *Working at Distance*, to worke by the Continuance of a *Fit Medium*; As *Sound* will be conueyed to the *Eare*, by striking vpon a *Bow-String*, if the *Horne* of the *Bow* be held to the *Eare*.

The *Writers* of *Naturall Magicke*, doe attribute much to the *Vertues*, that come from the *Parts* of *Liuing Creatures*; So as they be taken from them, the *Creatures* remaining still aliue: As if the *Creature* still liuing did infuse some *Immateriate Vertue*, and *Vigour*, into the *Part Senered*. So much may be true; that any *Part*, taken from a *Liuing Creature*, newly *Slaine*, may be of greater force, than if it were taken from the like *Creature*, dying of it *Selfe*, because it is fuller of *Spirit*.

Triall would be made, of the like *Parts* of *Individualls*, in *Plants*, and *Liuing Creatures*; As to cut off a *Stocke* of a *Tree*; And to lay that, which you cut off, to *Putrefie*, to see whether it will Decay the Rest of the *Stocke*: Or if you should cut off part of the *Taile*, or *Legge* of a *Dogge*,

or



or a *Cat*, and lay it to *Putrifie*, and so see whether it will *Fester*, or keepe from *Healing*, the *Part* which remaineth.

It is receiued, that it helpeth to *Continue Love*, if one weare a *Ring*, or a *Bracelet*, of the *Haire* of the *Party Beloued*. But that may be by the *Ex-citing* of the *Imagination*: And perhaps a *Glove*, or other like *Fauour*, may as well doe it.

The *Sympathie* of *Individualls*, that haue beene *Entire*, or haue *Tou-ched*, is of all others the most *Incredible*: Yet according vnto our faith-  
full Manner of *Examination* of *Nature*, we will make some little mention of it. The *Taking away* of *Warts*, by *Rubbing* them with Somewhat that afterwards is put to waste, and consume, is a Common *Experiment*: And I doe apprehend it the rather, because of mine owne *Experience*. I had, from my *Childhood*, a *Wart* vpon one of my *Fingers*: Afterwards when I was about Sixteene Yeares old, being then at *Paris*, there grew vpon both my *Hands* a Number of *Warts*, (at the least an hundred,) in a Mo-  
neths Space. The *English Embassadors Ladie*, who was a *Woman* farre from *Superstition*, told me, one day; Shee would helpe mee away with my *Warts*: Whereupon shee got a *Peece* of *Lard*, with the *Skin* on, and rubbed the *Warts* all ouer, with the *Fat Side*; And amongst the rest that *Wart*, which I had had from my *Childhood*; Then shee nailed the *Peece* of *Lard*, with the *Fat* towards the *Sunne*, vpon a *Post* of her *Chamber Window*, which was to the *South*. The *Successe* was, that within five weekes space, all the *Warts* went quite away: And that *Wart*, which I had so long endured, for *Company*. But at the rest I did little maruell, because they came in a *Short* time, and might goe away in a *Short* Time againe: But the *Going away* of that, which had staid so long, doth yet sticke with me. They say the like is done, by the *Rubbing* of *Warts* with a *Greene Elder Sticke*, and then *Burying* the *Sticke* to *Rot* in *Mucke*. It would be tried, with *Cornes*, and *Wens*, and such other *Excrescences*. I would haue it also tried, with some *Parts* of *Living Creatures*, that are nearest the *Nature* of *Excrescences*; As the *Combes* of *Cockes*, the *Spurres* of *Cockes*, the *Hornes* of *Beasts*, &c. And I would haue it tried both waies; Both by *Rubbing* those *Parts* with *Lard*, or *Elder*, as before; And by *Cut-ting off* some *Peece* of those *Parts*, and laying it to *Consume*; To see whe-  
ther it will *Worke* any *Effect*, towards the *Consumption* of that *Part*, which was once *Ioyned* with it.

It is constantly Receiued, and Auouched, that the *Anointing* of the *Weapon*, that maketh the *Wound*, will heale the *Wound* it selfe. In this *Ex-periment*, vpon the Relation of *Men of Credit*, (though my selfe, as yet, am not fully inclined to belecue it,) you shall note the *Points* following. First, the *Ointment*, wherewith this is done, is made of Diuers *Ingredi-ents*; whereof the Strangest and Hardest to come by, are the *Mosse* vpon the *Skull* of a *dead Man*, *Vnburied*; And the *Fats* of a *Boare*, and a *Beare*, killed in the *Act* of *Generation*. These two last I could easily suspect to be prescribed as a *Starting Hole*; That if the *Experiment* proued not, it mought be pretended, that the *Beasts* were not killed in the due Time;

For



For as for the *Mosse*, it is certaine, there is great Quantity of it in *Ireland*, vpon *Slaine Bodies*, laid on *Heapes*, *Vnburied*. The other *Ingredients* are, the *Bloud-Stone* in *Powder*, and some other *Things*, which seeme to haue a *Vertue* to *Stanch Bloud*; As also the *Mosse* hath. And the *Description* of the *whole Ointment* is to be found in the *Chymicall Dispensatory* of *Crollius*. Secondly, the same *Kinde* of *Ointment*, applied to the *Hurt* it selfe, worketh not the *Effect*; but only applied to the *Weapon*. Thirdly, (which I like well) they doe not obserue the *Consecrating* of the *Ointment* vnder any certaine *Constellation*; which commonly is the *Excuse* of *Magicall Medicines*, when they faile, that they were not made vnder a fit *Figure* of *Heauen*. Fourthly, it may be applied to the *Weapon*, though the *Party Hurt* be at great *Distance*. Fifthly, it seemeth the *Imagination* of the *Party*, to be *Cured*, is not needfull no *Concurre*; For it may be done, without the *Knowledge*, of the *Partie Wounded*; And thus much hath beene tried, that the *Ointment* (for *Experiments* sake,) hath beene wiped off the *Weapon*, without the *knowledge* of the *Partie Hurt*, and presently the *Party Hurt*, hath beene in great *Rage* of *Paine*, till the *Weapon* was *Reannointed*. Sixthly, it is affirmed, that if you cannot get the *Weapon*, yet if you put an *Instrument* of *Iron*, or *Wood*, resembling the *Weapon*, into the *Wound*, whereby it bleedeth, the *Annointing* of that *Instrument* will serue, and worke the *Effect*. This I doubt should be a *Deuice*, to keepe this strange *Forme* of *Cure*, in *Request*, and *Vse*; Because many times you cannot come by the *Weapon* it selfe. Seuenthly, the *Wound* must be at first *Washed cleane*, with *White Wine*, or the *Parties owne Water*; And then bound vp close in *Fine Linnen*, and no more *Dressing* renewed, till it be *whole*. Eightly, the *Sword* it selfe must be *Wrapped vp Close*, as farre as the *Ointment* goeth, that it taketh no *Wind*. Ninthly, the *Ointment*, if you wipe it off from the *Sword*, and keepe it, will *Serue againe*; and rather *Increase* in *vertue*, than *Diminish*. Tenthly, it will *Cure* in farre *Shorter Time*, than *Ointments* of *Wounds* commonly doe. Lastly, it will *Cure* a *Beast*, as well as a *Man*; which I like best of all the rest, because it subiecteth the *Matter*, to an *Easie Triall*.

I Would haue *Men* know, that though I reprehend, the *Easie Passing* *ouer*, of the *Causes* of *Things*, by *Ascribing* them to *Secret* and *Hidden Vertues*, and *Proprieties*; (For this hath arrested, and laid asleepe, all true *Enquiry*, and *Indications*;) yet I doe not vnderstand, but that in the *Practicall Part* of *Knowledge*, much will be left to *Experience*, and *Probation*, whereunto *Indication* cannot so fully reach: And this not onely in *Specie*, but in *Individuo*. So in *Physicke*, if you will cure the *Iaundies*, it is not enough to say, that the *Medicine* must not be *Cooling*; For that will hinder the *Opening* which the *Disease* requireth: That it must not be *Hot*; For that will exasperate *Choler*: That it must goe to the *Gall*; For there is the *Obstruction* which causeth the *Disease*, &c. But you must receiue from *Experience*, that *Powder* of *Chamapytis*, or the like, drunke in *Beere*, is good for the *Iaundies*: So againe, a wise *Physitian* doth not continue  
still

Experiment  
Solitary, touching  
Secret  
Proprieties.



Experiment  
Solitary, tou-  
ching the Ge-  
nerall Sympathy  
of Mens Spirits.

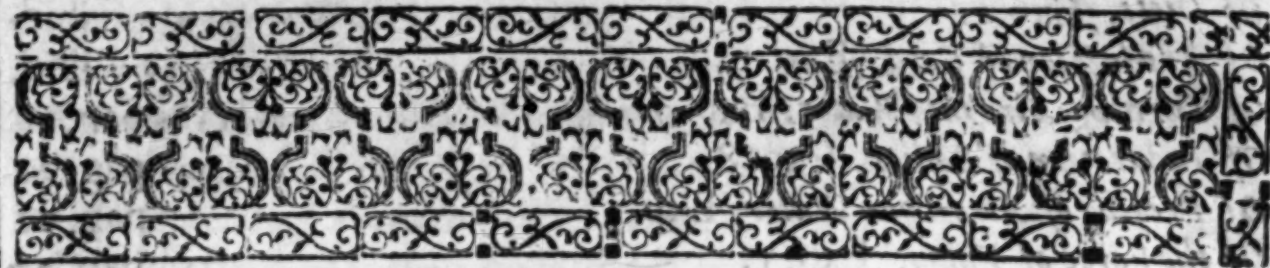
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still the same *Medicine*, to a *Patient*; But he will vary, if the first *Medicine* doth not apparently succeed: For of those *Remedies*, that are good for the *Jaundies*, *Stone*, *Agnes*, &c. that will doe good in one *Body*, which will not doe good in Another; According to the Correspondence the *Medicine* hath to the *Individuall Bodie*.

**T**He *Delight* which *Men* have in *Popularitie*, *Fame*, *Honour*, *Submission*, and *Subiection* of other *Mens Mindes*, *Wills*, or *Affections*, (although these *Things* may be desired for other *Ends*) seemeth to be a *Thing*, in it selfe, without Contemplation of Consequence, Gratefull and agreeable to the *Nature* of *Man*. This *Thing* (surely) is not without some Signification, as if all *Spirits* and *Soules* of *Men*, came forth out of one *Divine Limbus*; Else why should *Men* be so much affected with that, which others thinke, or say? The best Temper of *Mindes* desireth Good *Name*, and *True Honour*: The *Lighter*, *Popularity*, and *Applause*; The more depraved, *Subiection*, and *Tyranny*; As is scene in great *Conquerours*, and *Troublers* of the *World*: And yet more in *Arch-Heretickes*; for the *Introducing* of new *Doctrines*, is likewise an *Affectation* of *Tyrannie*, over the *Vnderstandings*, and *Beleeves* of *Men*.

A





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ATLANTIS.

A VVorke vnfinished.

VVritten by the Right Honourable, FRANCIS  
*Lord Verulam, Viscount St. Alban.*

